

**Virginia Schools in the Atomic Age—An Evaluation of
the Curriculum, Teacher Training and Certification,
and Related Matters**

**REPORT OF THE
COMMISSION ON PUBLIC EDUCATION
to the
HONORABLE J. LINDSAY ALMOND, JR.
Governor of Virginia
and
THE GENERAL ASSEMBLY OF VIRGINIA**



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AND RELATED MATTERS.

REPORT OF THE
COMMISSION ON PUBLIC EDUCATION

Richmond, Virginia,

January 8, 1960

To:

HONORABLE J. LINDSAY ALMOND, JR., *Governor of Virginia*

and

THE GENERAL ASSEMBLY OF VIRGINIA

The General Assembly of Virginia, concerned with widespread reports that many schools throughout the nation, including most of those in Virginia, have not been providing the quality of education demanded in these times of rapid scientific advancement and critical international tensions, and being also aware that no thorough overall survey of the progress of Virginia's schools had been made for more than a decade, at its 1958 Regular Session adopted Senate Joint Resolution 14, which directed such a survey. The text of this resolution was as follows:

SENATE JOINT RESOLUTION NO. 14

*Creating a commission to study the curriculum
of the Public Free Schools.*

Whereas, the report of the Virginia Education Commission, generally referred to as the Denny Commission, which was made to the Governor and General Assembly on December 1, 1944, emphasized the need for a study and survey of the public school system from time to time in order to determine its achievements and those matters which should be remedied and corrected; and

Whereas, the Virginia Advisory Legislative Council has, in a report made to the Governor and General Assembly in 1957, outlined deficiencies in the teaching of the sciences in the public schools and recommended means whereby these deficiencies might be corrected; and

Whereas, it would appear that the time has come for a far-reaching and thorough investigation of the public free schools and the training of teachers therefor with a view to determining what changes, if any, are necessary in order to serve the people of Virginia better and to graduate students who are capable of profiting from a college education or becoming, upon their graduation from high school, informed and participating members of our society; now, therefore, be it

Resolved by the Senate of Virginia, the House of Delegates concurring, That a Commission is hereby created to be known as the Commission on Public Education, to make a thorough study and report upon the public school system of Virginia, including among other matters, the effectiveness of the present curriculum and the training and certification of teachers. The Commission shall be composed of eleven members, of

whom two shall be appointed by the President of the Senate from the membership of the Senate, three shall be appointed by the Speaker of the House of Delegates from the membership thereof, and six shall be appointed by the Governor from the State at large. The Governor shall appoint the chairman of the Commission. All agencies of the State shall assist the Commission in furnishing information when requested so to do.

The Commission shall make a thorough appraisal of our public school system, including therein an objective survey of the curriculum and the training and certification of teachers and the changes, if any, required to make the public schools more efficient and more responsive to the needs of our society. The Commission shall conclude its study and make its report to the Governor and the General Assembly not later than October 1, 1959. The members of the Commission shall receive no compensation for their services but shall be paid their necessary expenses, for which, and for such secretarial and other assistance as the Commission may require, there is hereby appropriated from the Contingent Fund of the General Assembly the sum of ten thousand dollars.

The Commission was also, by Senate Joint Resolution No. 45, directed to include in its study the proper treatment, in the school curriculum, of certain historic papers which were significant milestones in the history of this Commonwealth and the Nation. This resolution was as follows:

SENATE JOINT RESOLUTION NO. 45

Requesting the Commission on Public Education to require study of the historical significance of the Leedstown Resolutions and the Fincastle Resolutions.

Whereas, Virginia has ever been in the fore as a champion of fundamental human rights and the basic dignity of man; and

Whereas, the Leedstown Resolutions of February 27, 1766, and the Fincastle Resolutions of January 20, 1774, are early examples of the determination of Virginians to resist tyranny and oppression in all forms, the former antedating by nearly a decade any other formal expression of the spirit of the people of this great country; and

Whereas, it is essential that our youth be imbued with the traditions and ideals of the past if Virginia is to continue in her preeminent position among her sister states as a defender of freedom and equality for all; now, therefore, be it

Resolved by the Senate, the House of Delegates concurring, That the Commission on Public Education, created by Senate Joint Resolution Number 14, is hereby directed to consider the desirability of the inclusion of the study of the historical significance of the Leedstown Resolutions and the Fincastle Resolutions in the curricula of all public schools.

Pursuant to Senate Joint Resolution No. 14, the President of the Senate appointed William B. Spong, Jr., of Portsmouth, and Mosby G. Perrow, Jr., of Lynchburg, as members of the Commission; the Speaker of the House of Delegates appointed D. French Slaughter, Jr., of Culpeper, James M. Thomson, of Alexandria, and C. Stuart Wheatley, Jr., of Danville, to the Commission; and the Governor appointed Jerry G. Bray, Jr., Judge, Corporation Court, South Norfolk, James W. Fletcher, Attorney at Law, Sperryville, Thomas L. Lanier, Treasurer, Newport News Shipbuilding and Drydock Company, Newport News, William S. Mundy, Jr., member, Lynchburg City School Board and Attorney at Law, Lynchburg, Har-

old W. Ramsey, Superintendent of Schools of Franklin County, and Mrs. Bess Willis Shrader, Chairman of the School Board of Amherst County, Amherst, as members of the Commission. The Governor designated Senator Perrow as Chairman of the Commission. On April 26, 1959, Senator Perrow resigned from the Commission. Senator George S. Aldhizer, II replaced Senator Perrow. William B. Spong, Jr., was commissioned as Chairman by the Governor on May 4, 1959. Subsequently, Mr. Wheatley, who had not offered for reelection to the House of Delegates, also resigned from the Commission.

The Commission formally organized on June 29, 1959. Mr. Slaughter was elected Vice-Chairman of the Commission, and John B. Boatwright, Jr., and G. M. Lapsley were appointed Secretary and Recording Secretary, respectively.

On August 12, 1959, C. Jackson Salisbury, Assistant Professor of Educational Administration, University of Virginia, was retained as Consultant to the Commission. The following staff members assisted Dr. Salisbury in the conduct of his study: James Colbert, Graduate Assistant, Walter I. Meilbronner, Assistant Professor of German, William C. Lowry, Associate Professor of Mathematics Education, Leonard Pikaart, Graduate Assistant, David D. Redfield, Research Assistant, and Virgil S. Ward, Associate Professor of Education, all of the University of Virginia.

From the outset the Commission has been fully conscious of the vast scope of the task assigned to it. At its initial meeting, being conscious of the limited time available in which to complete its study, the Commission prepared an agenda in an attempt to limit its activities to the matters which were most vital and which could be given adequate consideration in the time available. Throughout its study, the Commission has steadfastly sought to devote its major attention to these matters.

The Commission was aided in its task by the fact that the State Board of Education, throughout the past two years, has been conducting an intensive study of two major facets of the problem which the Commission was directed to study. On January 23, 1958, the State Board of Education created a committee to study the curriculum of the public schools under the chairmanship of Mrs. Gladys V. V. Morton. This committee completed its study of the curriculum of the secondary schools and made a report to the State Board which, on December 11, 1958, adopted a statement of policy making drastic revisions in the curriculum offering in the Virginia public schools. (The Committee's study, insofar as it relates to the curriculum in the elementary grades, was not completed in time to be of assistance to the Commission but changes in the elementary offering also are being considered.)

Also, in February, 1958, the State Board of Education took action with respect to the matter of teacher certification. This action, as well as the curriculum changes, will be discussed at length subsequently in this report.

During the course of its study, the Commission conferred on numerous occasions with Dr. Davis Y. Paschall, Superintendent of Public Instruction, and Mr. J. G. Blount, Finance Director, Department of Education. The staff of the Department of Education was most cooperative in compiling data upon a variety of subjects at the Commission's request.

The Commission also circularized the heads of the several institutions of higher learning in the State, both public and private, and secured from a number of these expressions of their views on particular points which the Commission had under study. It conferred with representatives of the teacher training institutions and the University of Virginia and the College of William and Mary. These institutions were represented respectively by Dr. Francis J. Lankford, Jr., President of Longwood College, Dr. Charles K. Martin, Jr., President of Radford College, Dr. Raymond J. Poindexter, Jr., of Madison College, Colgate W. Darden, Jr., former President of the University of Virginia, and R. W. Cherry, Dean of the School of Education of the University, and Admiral Alvin D. Chandler, President of the College of William and Mary. It also conferred with Dr. Dabney S. Lancaster, former Superintendent of Public Instruction, former President of Longwood College, and currently President of the Council of Higher Education.

The Commission also held a public hearing, at which it received much helpful information from representatives of the Virginia Education Association, the Virginia Teachers Association, The Virginia School Board Association, and The Virginia Congress of Parents and Teachers, as well as interested members of the public. It further conferred with profit with representatives of the Virginia Association of School Administrators. It received first-hand information concerning what is taking place in the educational systems of Russia and of certain other European countries from distinguished educators who had recently visited those countries.

The Commission also had the benefit of a number of reports which have been made on different phases of the Virginia School System in the past. The resolution creating the Commission makes reference to the report of the Virginia Education Commission, commonly called the "Denny Commission", which was made to the General Assembly in 1945. This report contained much helpful background information. The Commission also read with much interest the 1957 report of the Virginia Advisory Legislative Council entitled "Education of Scientists, Engineers, and other Specialists" and the Virginia Education Facilities Committee Report of April, 1959. In this connection there was also presented for its consideration a recent report compiled by the Division of Educational Research of the University of Virginia entitled "An Assessment of the Programs, Staffs and Facilities of Virginia Public High School Science Departments". The Commission also had the benefit of a recent study of Virginia education made by the Virginia State Chamber of Commerce. The literature in this field is quite voluminous and the Commission has had occasion to refer to a great many other publications; however the above reports are mentioned because it is felt that they are particularly significant in any consideration of the problems of public education in Virginia.

The above detailed discussion of the activities of the Commission and the procedures it followed has been presented as a frame of reference for the body of the Commission's report which follows. The Commission has not had an opportunity to make a definitive study; but it believes that it has developed sufficient data to insure the validity of the conclusions and recommendations hereinafter set forth.

II

THE RUSSIAN CHALLENGE

The successful launching by the Russians of a space satellite in October, 1957, focused the attention of the American people upon education to a larger and more intense degree than at any other period of our history. The satellite became at once a symbol of competition, of challenge, of threat, and a source of wounded pride. This spectacular scientific achievement provoked loud cries for the emulation of Russian educational methods, and for reappraisals of our American school systems. It was in this atmosphere that the resolution creating this Commission was adopted.

On January 27, 1958 an agreement was negotiated by the United States Department of State with the U.S.S.R. which made possible the first official United States education mission. The report of this group¹ did not attempt any comparison between our own schools and those of the Soviet Union. Different goals and objectives are apt to make such comparisons misleading. The strongest impressions recorded by the members of the mission include the zeal of the Russian people for education and the rapidly increasing degree of educational opportunity in the Soviet Union.

This Commission has heard and read conflicting opinions concerning the excellence of Russian education. We recognize that even now the Soviet systems of schools are undergoing changes of policy which make accurate appraisal difficult. Nevertheless, we are compelled to observe that every source we have encountered indicates that Russians today are consumed by a desire to become educated and to excel. The Chairman of the School Board of the City of Richmond in a report following a recent trip to Russia² and in his remarks to this Commission described the attitude toward education of the Soviets as approaching a religious belief in the intensity of feeling and conviction that through education they can lead the world.

Virginians and all Americans must recognize that we are today engaged in a competition for survival imposed upon us by a nation of vast resources, whose leaders, through education offered to people with a boundless zeal for self-development, are determined to cast the shadow of Communism over the entire world.

The many distinguished educators who have appeared before this Commission were unanimous in their opinion that the answer to the problem presented by the Russian challenge is not to be found in the imitation of Soviet educational methods. With this we agree. Russian educational systems are geared to Soviet objectives. Total service to the state and total devotion to a single political doctrine are alien to the American educational philosophy, but they are basic aims of the Russian educational effort. Nevertheless, the products of our educational system must be superior to the products of the Russian educational system. Differences in the philosophy and objectives of education must not be used as a cloak for inferiority.

In this report, recommendations for immediate measures and for

¹ *Soviet Commitment to Education—1959*

² *Soviet Education—A Means Toward World Domination*
Lewis F. Powell, Jr., August, 1958

continued study are hereinafter suggested. The immediate measures, we believe, will improve the quality of instruction in our secondary schools, especially in those areas made critical in this time of rapid scientific advancement. Most of the specific recommendations will require legislation for adoption. While we, of course, believe these measures will be helpful, candor compels us to report that much of what must be done is outside the scope of the legislative process. Attitudes cannot be legislated. Appropriations alone are not the answer to our present educational needs.

Hard work and penetrating intellectual effort are sacred maxims of Soviet education and the prestige of the teaching profession in Russia is such that it attracts many of that country's best minds. The challenge we face demands the most searching self-analysis. Are we willing and prepared to sacrifice in order that our own educational systems may attain the excellence demanded by the present world situation? Are the parents of our school children prepared to reevaluate concepts of the function of public education today, and to recognize that the schools should not be operated to relieve them of parental duties and responsibilities? Are our teachers willing to rededicate themselves to the continuing task of improving the quality of instruction? Are our students prepared to accept their schools as centers of hard work and intellectual effort? Are we prepared to acknowledge the tremendous responsibility now imposed upon our teachers in the training of our citizens of tomorrow?

In view of the Russian threat to our survival and the requirements of this challenging age, we shall assume throughout this report that the answer of Virginians to each of these questions would be in the affirmative.

III

EDUCATION AND THE VIRGINIA ECONOMY

For the last quarter century, and at an increased tempo during this decade, large areas of the Commonwealth have been changing from rural-agrarian to urban-industrial. As industry has moved into Virginia, there has also been a marked change in our agricultural economy, which has become diversified and more dependent upon scientifically and technically trained operators. This transition has resulted in an increased demand for trained personnel to keep pace with industrial growth and agricultural change.

Virginia is encouraging industrial development as never before. These efforts are understandable, for each year larger percentages of national income are derived from industry and manufacturing. A Commission charged with studying industrial development in Virginia reported in 1957 that increased employment in manufacturing is the most feasible way to assure that Virginia will eventually have income per capita in line with that of the country as a whole.³ This report also observed that of all the normal functions of state and local governments which might affect and influence industrial development favorably, or unfavorably, none is more important than education.⁴ Industry today requires an educated and technically trained labor force.

³ *Report of the Commission to Study Industrial Development in Virginia.*
Commonwealth of Virginia—1957, Page 11

⁴ *Ibid*, Pg. 59

As well as being a factor in influencing industrial development, education is also directly related to the economic level of a community. A comprehensive report released last year by the Virginia State Chamber of Commerce established a direct causal relationship between educational attainment and individual income in each county and all but two cities in the Commonwealth.⁵

In our efforts to raise the economic level of Virginia through industrial development, we are in vigorous competition with other states. Therefore it logically follows that Virginia is indirectly competing with her sister states in the field of education.

The Denny Commission filed its far-reaching analysis of the Virginia Public School System in 1944. This report made certain comparisons of Virginia's system with those of the other states. A comparison of the figures then and now is significant.

Table I shows data taken from the time of the Denny Commission Report and recent data available on these same measures.

Table I. Figures and Rank for Virginia in Measures Commonly Used to Compare States at Time of the Denny Commission Report and As Shown Now.

Measure	Denny Commission Report		Present Data	
	Figures 1941-42	Rank in U. S. 1941-42	Figures 1958-59	Rank in U. S. 1958-59
Percent of 14-17 year olds enrolled in school	55.4%	38th	77.6%	43rd
Per cent of enrolled pupils in public school attending daily	86.6%	23rd	89.0%	25th
Median years of school completed for persons 25 years of age and older	7.5 yrs. (1940)	43rd	8.5 yrs. (1950)	39th
Per cent of persons 25 years old and above with 4 yrs. or more of college	4.4%	27th	6.3% (1950)	17th
Current expenditures per pupil in average daily attendance	\$55.83	41st	\$245.	41st
Average salary per member of instructional staff	\$1,047.	39th	\$4,000.	37th
Relative tax-paying ability expended for public schools	49%	44th	Comparable data not available	
State and local tax revenues (Fiscal 1957) as a per cent of personal income	Comparable data not available		8.0%	33rd

⁵ *Needs for the Improvement of Virginia Education.* Virginia State Chamber of Commerce, 1959.

The total expenditures for public education in Virginia in recent years are also significant. In the 1947-48 school year the total amount expended for public education, including capital outlay and debt service, was nearly 71½ millions. By 1958-59 this figure had increased to almost 255 millions.

Although expenditures have increased appreciably the rank of Virginia on a national basis remains relatively the same. While this Commission is aware that sound management at the state and local level have given Virginians more for their school dollar than in many states, still we must observe that greater effort in the field of education should be exerted if the Commonwealth is to be developed to the desired economic level.

IV

THE PUBLIC SCHOOLS OF VIRGINIA TODAY

Over 800,000 Virginians—almost one out of every five people in the State—now attend the public schools. Virginians spent about one hundred eighty one million dollars to operate public schools in Virginia in the 1958-59 school year, exclusive of capital outlay and debt service. Public education is indeed a most vital element in the life of Virginia.

Today, however, perhaps as never before, there is an increased awareness by all Virginians of the urgent need to elevate the entire educational system to a new level of discipline and excellence. In this present climate of public opinion there comes the temptation to rush ahead with recommendations for vast and far-reaching changes in education, many would no doubt prove beneficial and others might over the long haul prove an extravagant waste of the taxpayers' money and some might even be detrimental to a sound and well-balanced State-supported educational program. We have sought to resist this temptation until the entire field of public education can be explored fully.

Nevertheless, in our limited study of the broader aspects of public education, some things have become readily apparent. For example, a wide disparity exists in teachers' salaries across the State. Salaries in some Virginia school systems are equal to the highest paid in the nation, and in other school systems the salaries are considerably below those in neighboring states. We have also observed that some of our schools are offering curricula which equal those of any high school in America. These schools offer strong programs in the sciences, in mathematics, in foreign languages (including Russian and Chinese) and in the humanities. They are able, because of the size of their student bodies, to move children along "tracks," some in a faster "track" than others, so that each child is challenged to the limit of his ability. In contrast, some of our other high schools, particularly the smaller ones, have a minimum of offerings; i.e. two years of foreign language, certain science courses only in alternate years, etc. A general impression of public education in Virginia is one of contrasts—the excellent versus the mediocre. The great need of the moment is to discover how we can improve immediately those schools which are now only mediocre.

During the past several months the Commission has heard from a great number of individuals including representatives of organizations connected with, or interested in, public education. We have also examined many reports and recommendations of such organizations together

with the reports of the several previous State study commissions going back as far as the first comprehensive report on public education made in 1918.

We have been particularly impressed by three things during our study:

First, by the unanimity of opinion among those who appeared before us in person or sent written communications, as to the present necessity for:

- (A) Improving the quality of teaching, and
- (B) Strengthening the offerings in science, mathematics, foreign languages and English while at the same time preserving a balanced curriculum.

Second, by the progress made toward those goals in the last two years. The new requirement of a broad, basic education for teacher certification which will become effective throughout the State in 1960, will move Virginia to a place among the top states. An additional measure designed to strengthen the quality of teaching has been the expansion of the teacher scholarship program. At the same time, the high school curriculum has undergone strengthening so that no state will require higher standards of its high school graduates than Virginia. We heartily commend the Department of Public Education, the local school systems and the institutions of higher learning for these progressive steps. Yet for all our recent progress toward improving public education, little more than a beginning has been made on the formidable task that lies ahead.

Third, by the soundness, as well as the appropriateness today, of certain suggestions and recommendations made by previous study commissions. It is a matter of sincere regret that for one reason or another many of their recommendations have not been adopted. We shall bring some of these recommendations to the public attention again and in some instances urge their immediate adoption.

A special commission is currently exploring the use of television as an aid to education, therefore the subject has not been considered by this Commission.

The time factor as well as the specific directions of the General Assembly made it necessary for the Commission, early in its deliberations, to assign a priority to the facets of the public school system which would be studied first. In the main, our comments, conclusions and recommendations will refer to the secondary school system. Because some phases of secondary education are not treated fully herein does not mean they should not be fully studied. They do merit further study at the earliest possible date. A comprehensive study of elementary education is also indicated, together with a number of other subjects, all of which are set forth at the conclusion of this interim report.

Shortly after the organization of the Commission its members were invited to make suggestions of subjects to be studied.

Subsequently, these suggestions were consolidated and they form the basis for the remainder of this subdivision of the report on "The Public School of Virginia Today." The various items are: the curriculum, teacher training, teacher certification, extracurricular activities, testing and guidance, summer schools and consolidation of high schools.

A. CURRICULUM

On December 11, 1958, the Virginia State Board of Education issued a statement of policy embodying changes in the high school program in Virginia, and new requirements for high school graduation. The changes will be referred to frequently in this report, and, since they have just become effective as of this past September, are of such importance that we include them in their entirety, as Appendix I.

The new high school program raises the number of units required for graduation from 16 to 20 and makes the eighth grade an integral part of a five-year program. The areas of science and mathematics are strengthened and the study of algebra and foreign languages may be commenced by students as early as the eighth grade. Planned student programs are encouraged and with the extra year, academically talented students are able to take advanced placement work in the later high school years.

The five-year program is unique. Its success will depend largely on the utilization of the eighth grade. It must be implemented by proper guidance, highly trained and dedicated teachers and students prepared for hard intellectual effort. With proper guidance, eighth grade students can begin a program designed to meet their individual capabilities. It is hoped that the English, mathematics, science and language courses offered at this level will be incentives for the academically talented pupil. The State Board of Education is to be commended for taking this step.

The next seven sub-sections are devoted to specific courses of the high school curriculum.

1. *Science*

No aspect of education has received more attention of late from writers, speakers and the general public than science. It is a subject not only of local and state concern but of national and international concern. This is true because we live in a technological age in which science has become a potent factor in the survival of nations.

Although we are stressing the teaching of science in high school it is vital that the curriculum be kept in balance as science is only one of the fields in which children need to be educated. The scientist lacking skill in the communication arts cannot transmit his knowledge effectively. Without a sound basis in mathematics, mastery of science is severely handicapped except in some very special fields.

This Commonwealth, the birthplace of Washington, Jefferson, Madison and the other founders of the republic cannot overlook the humanities and thus turn her back upon our great heritage.

The report of the Virginia Advisory Legislative Council on the Education of Scientists, Engineers and Other Specialists, 1957, made this observation on the approach to education in the sciences:

"The democratic method of providing opportunity for adequate training in science and similar fields and of encouraging those with aptitude to take that training is preferred to requiring students to take more science or mathematics courses. The guidance program should be so oriented as to have students early in their high school career advised of the openings for properly trained college graduates in the fields of science and engineering and parents should

be encouraged to have their children pursue their studies in the fields in which they have aptitude and interest."

Obviously the need for additional scientists is urgent. Educators have advised us that with proper guidance academically talented children will pursue studies in the sciences. Our report contains a recommendation for the strengthening of the guidance program.

Many colleges and universities throughout the country, in conjunction with the National Science Foundation, have developed specific programs for providing stimulus to talented high school students through summer institutes. Only one of these institutes has been provided in Virginia⁶ and more are needed.

A recent field study⁷ of representative Virginia high schools to determine characteristics of high school science programs in 1958-59 resulted in these very pertinent findings:

1. The laboratory facilities for secondary science instruction were generally inadequate.
2. Several small rural schools were not offering a well-rounded program to their students.
3. School library facilities in many ways inadequately supported science education.
4. Existing laboratory equipment frequently received little care or maintenance.
5. Overcrowded conditions represented a serious problem.
6. Science teachers read little professionally related literature and did not belong to professional organizations related to science and mathematics.
7. Science teachers were inadequately prepared.
8. Schools received little outside assistance for science education.
9. Too few opportunities were made available for the talented student.

In summary, these findings point up the need for improving the quality of instruction, increasing the science offerings in many high schools and providing additional laboratory facilities. To keep our teachers abreast of developments in the scientific field seems almost a Herculean task but it must be done if we are to meet the challenge of the scientific age. We have set forth ways and means for upgrading science teachers in the section on "Teacher Training."

Attention is invited to the program conducted at some of our Virginia colleges and universities in conjunction with the National Science Foundation. These programs include the Academic Year Institutes for Teachers, workshops and summer institutes for teachers.

The cooperation of industry should be sought so that mutually beneficial arrangements can be made to help train teachers to provide the kind of graduates which industry needs. Industry can help by providing facilities, instruction, part-time employment for science

⁶ Emory and Henry College

⁷ *An Assessment of the Programs, Staff and Faculties of Virginia High School Science Departments.* Redfield and Hedges—1959

teachers and/or talented science students and assistance in continuous evaluation of instructional programs. The degree to which industry and educators share mutual aims was demonstrated at the Virginia Education Association Instructional Institute which was conducted at Longwood College in August, 1958. The Association of Virginia Colleges and the Virginia Manufacturers Association cooperated in sponsoring this conference.

Despite the fact that evidence exists that some laboratory equipment is not being efficiently used, it is evident to the Commission that there is an acute shortage of laboratory equipment in many high schools of the State. The National Defense Education Act has assisted schools with the purchase of laboratory equipment, yet something should be done by the State. For many years the State has assisted localities in purchasing teaching materials and has offered financial assistance to school libraries. We concur with the recommendation of the V.A.L.C. Report, *Education of Scientists, Engineers and Other Specialists*, which proposed that the State establish a policy of assisting the localities in the purchase of adequate equipment for use in classes in the sciences. A fund should be established for this purpose.

Textbook and supplementary reference books are as necessary to teachers as medicines and surgical instruments are to physicians and surgeons. However, many of our science textbooks (physics in particular) are absolutely behind the times. Some in use today still state that it is impossible to split the atom!

The Massachusetts Institute of Technology will shortly release new textbooks for high schools which are "space age" in concept and treatment. These should be evaluated by our State Board of Education and made available to our schools immediately, if found acceptable. No delay should be allowed in getting the best textbooks. Pressure should be exerted upon textbook publishers for up-to-date material.

Our consultant staff made several observations with respect to the teaching of high school science in Virginia. They are summarized below:

1. An adequate program in science can only be provided and the expenses justified by consolidation of high schools in many Virginia communities.
2. A two-year study should be made of both primary and secondary curriculum to assess the adequacy of the science offerings and the effectiveness of science teaching.
3. More active leadership and assistance should be made available to the classroom teachers from the State Department level and by district supervisors for science.
4. Increased opportunity should be made available for all our gifted students.
5. Schools should be so organized that there is an absolute minimum of six periods each day in addition to the time required for physical education or driver training.
6. Careful consideration and study should be given to the *quality* and *availability* of library facilities for high school science education.
7. Interested students should be employed as laboratory assistants and given nominal remuneration for their services.

8. College laboratory courses should be developed which are oriented toward teaching high school laboratory science.
9. Tuition-free summer schools should be provided with courses available for the bright and ambitious students who desire to broaden their knowledge through advanced study.

A number of the suggestions enumerated above have been adopted by the Commission and are embodied in the recommendations at the conclusion of the report. The Commission is of the opinion that further data should be collected and consideration be given to the remaining suggestions.

2. Mathematics

The new State requirements for high school graduation referred to earlier in this report make it easier for schools to set up programs in which able students in mathematics may take elementary algebra in the eighth grade. A number of schools in Virginia are already doing this. This new State regulations in the five-year high school program, the emphasis on better programs for the gifted and the academically-talented, and a long-term dissatisfaction with the content of traditional eighth grade arithmetic—particularly for the more able pupils—are factors abetting this innovation.

Prior to September, 1959, one unit of mathematics out of a total of 16 units was required beyond the eighth grade for graduation from high school. Schools with an eighth grade usually required mathematics during that grade, but in some cases one-half year was devoted to mathematics and the other half year to science. Starting with the class entering the eighth grade in September, 1959, 20 units during the upper five grades, eight through twelve, are required for graduation. Two of these units must be in mathematics. Some school systems are now requiring three units of mathematics for graduation.

While there is a general awareness that changes are taking place in the fields of science and foreign languages, most people would probably ask, "What possible changes could there be in the field of mathematics?" Our study staff has made some observations regarding the new concepts in the teaching of school mathematics and the mathematics curriculum. These are set out in Appendix II for the purpose of indicating the trend of changes in teaching this subject, as well as to explain the term "Modern Mathematics."

"Modern mathematics" is scarcely reflected in the traditional high school program and, in fact, very little in the undergraduate college program. "Modern mathematics" as far as the high school program is concerned refers as much to a modern treatment of traditional topics in mathematics—most of which are as important today as ever—as it does to new content for the program. In fact, with some notable exceptions, the changes being proposed today for high school mathematics are not radical changes in the content to be studied, but are in the main concerned with the teaching of the traditional topics of algebra, geometry, and analysis from a modern point of view.

A study of 1957 high school graduates in Virginia indicated that the number taking a fourth year of mathematics was below the national average.⁸ The new five-year program for high school graduation offers an

⁸ *Courses Taken and Number of Years Credit Earned in Mathematics, Science, and Foreign Languages by Certain 1957 Virginia High School Graduates.*
Lewis O. Turner, University of Virginia, July, 1958.

opportunity for qualified eighth grade students to take algebra. If students are stimulated to take algebra at this earlier level, it is entirely likely that the trend will be reversed.

While a shortage of teachers of mathematics exists and the prospects of obtaining additional teachers in the near future are dim, of more immediate concern in view of the changes being proposed both in course content and method, is the in-service education of mathematics teachers. They need to be brought up-to-date. This may be done through intensive summer and academic year institute programs, such as those sponsored by V. P. I. and the University of Virginia. These institutes are presented in cooperation with the National Science Foundation and certain forward-looking industries. Short conferences, study groups, in-service courses, lecture series, and professional meetings are of considerable help in indicating trends and describing some of the proposals for changes, but they cannot accomplish the task of reeducating the teacher for the changes.

Such institutes, workshops and courses as mentioned above should be expanded where already existing, and new programs provided throughout the State. The Commission is proposing special summer institutes for teachers of mathematics in the section on "Teaching Training."

It is a hopeful sign that two of the State teacher training institutions, Longwood and Madison Colleges, report that the number of students taking mathematics is increasing.

The usual graduate courses in mathematics are often not suitable for secondary-school teachers who have not pursued the formal study of mathematics for some years. Moreover, the aim of these courses is usually toward mathematical research, while the secondary school teacher needs a broad understanding of the elementary aspects of mathematics. The Commission recommends that, when possible, the universities and colleges devise for these teachers special courses in such areas as modern algebra, geometry (other than Euclidean), statistics, analysis and advanced seminars in the problems of secondary education and the teaching of mathematics.

3. Foreign Languages

The position of world leadership which World War II and its aftermath have thrust upon the United States requires that our citizens be able to speak the language of others. There is a need for linguists in the fields of diplomacy, business, the Armed Forces, and in higher education. It goes almost without saying that in our race for supremacy against Russia and the Communist world, to be a nation of only highly skilled technicians would be hardly sufficient. Furthermore, the study of foreign languages from time immemorial has been an integral part of a well-rounded liberal education.

One generalization that can be made not only on the status of foreign language study in Virginia, but on a nationwide basis, is that there is not sufficient continuity in this field. In Virginia today practically all high schools offer one or more foreign languages, but students usually take a foreign language for only two years during their high school career. The drop-out rate after two years of foreign language study is quite alarming and points up the fact that this two-year study is, to a large extent, wasted when these students enter universities and colleges. An examination of the number of years of foreign language instruction taken by academically talented graduates of Virginia high schools is revealing. This data is shown in Table II following:

TABLE II
Advanced Courses in Foreign Languages Taken by 1957
Academically Talented Graduates of Certain Virginia
High Schools.*

Size of School	Number of Academically Talented Boys	Percentage Completing		
		2 years	3 years	4 years
125 or more tenth grade pupils	451	58.3	7.1	7.1
Less than 125 tenth grade pupils	216	46.8	4.2	5.1
	Number of Academically Talented Girls			
125 or more tenth grade pupils	431	35.7	13.2	29.5
Less than 125 tenth grade pupils	239	46.9	7.9	15.1

* This information was taken from The Virginia School Boards Association study, *The Virginia High School Today*.

We have found unanimous agreement among the many educators, including specialists in certain foreign languages, who appeared before the Commission, that students should take at least three years of one foreign language in high school in order to receive any lasting benefit.

Experiments are now being conducted in the teaching of foreign languages in the elementary grades. Thus far the results appear to be excellent where well-qualified elementary teachers are available. The 1959 curriculum changes encourage qualified eighth grade students to study language. The response, especially in Latin, has exceeded expectations, and may presage a serious shortage of teachers of that classic language in the next few years.

Many teachers now in the field did not take a foreign language as their major field of study in college and, although competent in grammar, are unable to speak and understand the language. This is due in large part to the *older* method of teaching foreign languages in the colleges and universities which begins with and emphasizes grammar to the detriment of reading, writing and conversation.

The critical shortage of qualified foreign language teachers, especially those trained in the new method of instruction—that is, the beginning with learning to speak the language, then to read it and finally to write it—must be remedied as soon as possible. This can be accomplished in part by the retraining of some of our present foreign language teachers. Recommendations as to the ways and means of doing this are embodied in the section entitled “Teacher Training” and in the summary of the Commission’s recommendations.

The prospects for additional language teachers is not bright. It is a matter of considerable concern to the Commission that the offerings in foreign languages and the numbers of students majoring in these fields in our teacher training institutions are distressingly small. The almost total absence of prospective teachers studying Latin in our colleges is alarming, particularly in view of the interest in Latin now displayed by high school students.

We are encouraged by the fact that an increasing number of students at Madison College are majoring in foreign languages; however, some of our other teacher training institutions do not offer majors in these fields. The lack of student demand is some times cited to justify this situation. A beginning must be made in this direction and we are confident that if major fields of study in foreign languages are offered, they will attract the students necessary to justify the cost.

The Commission recommends that all State supported institutions of higher learning provide programs for majors in foreign languages and Latin.

Language laboratories have come into widespread use in the last few years as an aid in the teaching of foreign languages. This method of teaching languages has been proven in the Armed Forces. Our consultants have advocated increased use of these laboratories. Some of the cities, and some of the more heavily populated counties in Virginia, have been able to purchase the equipment necessary to set up these laboratories through utilization of funds made available under the National Defense Education Act. This program provides that the locality match the amount contributed by the Federal government. Many of the localities are unable to acquire this expensive equipment without some assistance from the State. State assistance to localities toward the purchase of language laboratory equipment is fully justified.

4. *English*

The goals of language instruction in our native tongue have not changed since the advent of western civilization. In making this observation, a report on the English curriculum expressed these goals as follows: "To think clearly and honestly, to read thoughtfully, to communicate effectively, and to listen intelligently are as important today as they ever were."⁹ Indeed, of all the subjects in our required curriculum, English is the most important. It carries over into all other subjects and encompasses grammar, literature, speech and dramatics. Regardless of occupation or profession, every student will live with English for the remainder of his life. A Virginia study of the teaching of English in our high schools stressed the importance of helping our young people to develop an "ability to communicate effectively through reading, writing, speaking and listening."¹⁰

During our study, opinions were sought from the presidents of the colleges throughout Virginia. One of the inquiries made concerned the preparation of Virginia's high school graduates for college, and the most general complaint registered by the colleges was that students today lack the ability to express themselves in writing and to read well. Some of the college deans and presidents expressed the opinion that students evidently go through high school today without doing much writing.

Business and professional people have for some time criticized the lack of writing skill and oral expression of many high school graduates. Studies indicate that this is directly related to large classes and resultant heavy workloads of teachers of English.

The recent changes in standards for high school graduation require that all students take five years of English during grades 8-12, inclusive. This is actually no change unless the course content and effectiveness of

⁹ Commission on the English Curriculum, *Language Arts for Today's Children*. Appleton-Century-Crofts, 1954

¹⁰ *The Teaching of English in Virginia High Schools*. Gresham, Foster B., 1955

instruction at the eighth grade level are strengthened. The eighth grade should also provide an opportunity for determination of ability grouping in English.

Requirements set up by state regulations create the framework for instruction in any subject, but the implementation provided by the local school division is a vital factor. Because of the lack of coordination and assignment of responsibility, it is possible that a pupil in some schools, could go through high school without having any training in certain essential phases of language instruction.¹¹ This could occur through having a certain combination of teachers each of whose efforts might be concentrated in certain phases of English instruction to the neglect of others. Coordination of instructional programs in English should be improved.

Research has indicated that doubling the amount of writing practice for students reduced failure 66% and improved grades 60%.¹² The California Council of Teachers of English found that different high school grade levels needed slightly different amounts of writing practice per week to develop competency in written expression.¹³ Most teachers felt that this averages out to about 250 words per pupil per week. The average time required to grade each of these papers *carefully*, make comments to show concern for students' ideas, to teach writing and thinking was 8.6 minutes per paper. This means 21.5 hours for first time over if 150 pupils is the load. If checking corrections or revisions of the compositions is done this would add 7.0 hours more.

Added to the 30 or 35 hours of class and school time this could make 62½ hours to teach class and grade papers. If the teacher also has extra-curricular activities assignments besides, they have to cut down someplace. If they reduce the amount of writing required of their pupils, it impedes the development of written expression. The same can be said for hasty and superficial grading of papers.

Dr. James B. Conant in his recent survey says:

"The time devoted to English composition during the four years should occupy about half the total time devoted to the study of English. Each student should be required to write an average of one theme a week. Themes should be corrected by the teacher. In order that teachers of English have adequate time for handling these themes, no English teacher should be responsible for more than one hundred pupils."¹⁴

The Virginia Association of Teachers of English recently completed a *Study of Teacher Load of Teachers of English in Virginia*, school year 1958-59. Data from this study was of considerable assistance to the Commission. One of the important facts to come from this study is that one half of our high school English teachers are also teaching other subjects, and/or supervising study halls. It is deplored that in some of our schools, English teachers are required to supervise study halls at the same time they are holding regular classes in the same room.

A comparison of the report of Virginia English teachers last year with the 1954 study by Dr. Foster B. Gresham of Longwood College shows

¹¹ Gresham, op. cit. p. 25

¹² *Review of Educational Research*—Lokke and Wykoff

¹³ Dusel, William J., "Determining an Efficient Teaching Load in English."
The Virginia English Bulletin, March 1956

¹⁴ *The American High School Today*

improvement over the past five years in the reduction of the number of pupils taught daily by English teachers. The earlier Gresham study showed that two-thirds of the English teachers in Virginia had a total number of pupils ranging from 151 to 250 daily. The study of the Virginia Association of Teachers of English showed that 58.4% of the English teachers had a daily pupil load in 1958-59 of 121-160 pupils.

The large number of pupils assigned to English classes in many schools and the large size of some of the classes interfere with effective teaching of English. The diversity of other-than-class duties dissipates the time and energy of the English teacher. These factors prohibit effective theme assignments and other activities essential to effective teaching. The need for corrective action is clearly indicated.

5. History, Government, Economics and Geography

Much of the Commission's time during this study has been devoted to those areas of the curriculum made critical by the needs of a changing world. The space in this report devoted to these courses of study should not imply that any less emphasis should be placed on other required subjects. Critical subjects should not be emphasized to the degree that an over specialized graduate results.

Patrick Henry, in perhaps his most famous speech, said "I have but one lamp by which my feet are guided; and that is the lamp of experience. I know of no way of judging the future but by the past." It has often been observed that those who do not study history are doomed to repeat the mistakes of the past.

Medical doctors in our armed forces have learned from former prisoners of war in Korea how few of our soldiers really had any concept of the basic principles of democracy upon which their own country was founded. It has been strongly suggested that many prisoners succumbed to communist brainwashing because they did not know enough about the history and government of our country to resist. A recent appraisal of American students in Europe concluded that they are lacking in knowledge of the history and politics of their own country.¹⁵ Here in Virginia, on whose soil the seeds of liberty have been nourished since colonial times, our citizens are more cognizant of heritage and tradition than in other parts of this nation. This Commission believes it important that all the students of Virginia be thoroughly familiar with the history of our state and our nation.

The new five-year high school program adds a third required social studies credit for graduation. The student may elect to study either world history or world geography. These courses are of tremendous importance in preparing the citizens of tomorrow for the momentous decisions of international importance which will certainly continue to confront our nation. World history and world geography are courses in which the text materials must be kept abreast of a rapidly changing world. America's position of leadership calls for a better understanding of the peoples of the world, and students can best acquire the foundation for such understanding with contemporary text books.

This Commission believes that the required history and government courses, as well as world geography and world history, afford an excellent opportunity for ability grouping in those high schools with a sufficiently large enrollment.

¹⁵ *From Main Street to the Left Bank*—Michigan State University Press—1959

Senate Joint Resolution 45 was referred to this Commission directing that consideration be given to including the study of the Leedstown Resolutions and the Fincastle Resolutions as a part of the curriculum in the public schools of Virginia. The Commission is able to report that the ideals expressed by these historic documents will be incorporated specifically by reference in the forthcoming editions of text books in history and government presently being used.

It has been suggested to this Commission that the free enterprise system as a basis for our economic development be made a required subject of study for high school graduation. We believe it necessary that young people be led to understand the importance of this concept, as compared with foreign ideologies. Careful thought should be given to the selection of text books in this area to the end that the material used will describe with accuracy our American way of life, and will insure that students will have an understanding of the free enterprise system and what it has meant to this country. We are advised that the State Board of Education presently has a committee working on the preparation of a course and selection of text materials for such an offering in economics for Virginia's secondary schools. If this is not offered as a separate course, the material should be incorporated in the teaching of American history and government.

6. Driver Training

The Commission heard considerable testimony as to the proper role of driver training in the public high schools in Virginia.

While mindful of the unnecessary carnage on the highways of the State and of the necessity for the beginning driver to receive proper instruction in the safe operation of motor vehicles, the Commission is of the opinion that the task of furnishing driver education to high school students with credit therefor is not the primary responsibility of the school.

The Commission wishes to commend the many high schools of the State which have taken the lead in making driver education available to their students as an elective course; however, with the present emphasis being properly placed on the importance of English, mathematics, science and the other fundamentals, the Commission is of the opinion:

(1) That driver education should not be a required subject, but an elective one only.

(2) That the courses in driver education should be made available to students primarily as a part of the summer school curriculum, or as a part of an after-school or Saturday program.

(3) That consideration be given to issuing only temporary or provisional permits to drive to persons under 18 years of age which would be converted into permanent permits upon the completion by the driver of an approved course in driver education.

7. Vocational Education

Public schools should provide for the education of all students to the limit of their respective abilities. To this end the Commission endorses a well-balanced comprehensive high school curriculum—one which will provide a general education program which is needed by all citizens; terminal programs for those who will enter the labor force directly after leaving high school; programs for those who will go on to technical and

apprenticeship training institutes, as well as those who will go on to a four year college.

It has been encouraging to note that vocational education in Virginia is designed to supplement, not replace, academic training. All fields of vocational training encourage students to take as many English, foreign languages, mathematics, and science courses as they can. The age of the non-academic vocational student has passed. The trend in vocational education is toward college level instruction.

Experts who have had an opportunity to evaluate vocational education programs in many states rank Virginia's program as a model and one of the finest in the nation. The major suggestion for its improvement seems to be that it should be placed within the reach of more people who can profit from vocational training.

In view of the fine quality of vocational education in Virginia, we deem it sufficient simply to set forth in this report some of the high lights of the program together with an indication of its importance in the changing pattern of economic development from rural-agrarian to urban-industrial.

Earlier in this report it was pointed out that industry needs an educated and technically trained labor force. Technological changes and scientific advances in agriculture, business, industry, and the service organizations demand not only that students be prepared in high school for employment and leadership in these fields, but that adults be re-trained and informed as well. In the competition we face in the world today and will face in the future, we cannot wait for the new generations coming through our schools to bring the new knowledge and skills to the labor force. This means that we must establish new programs and expand existing ones to upgrade our adults already in the labor force, as well as to prepare students now in high schools. A recent study made for the Advisory Council on the Virginia Economy states:

"Unless there are combined facilities for preparing youth and older people to take their places in an expanding economy, the possibility of industrial expansion is reduced."

The Advisory Council on the Virginia Economy urged that the State Department of Education and the Department of Labor and Industry program for training skilled workers be expanded, and that local school and civic officials cooperate in the planning required.

Agricultural education, business education, distributive education, home economics education, and trades and industrial education are provided within the Virginia vocational education program.

The trend in agriculture is toward fewer farmers and larger farms. Therefore, mechanization and scientific farming require that farmers be educated in modern methods. The nature of farm training as do other vocational fields, requires on-the-job supervision to be effective. Agriculture education in Virginia has long been aware of this fact and an extensive program of student planned and teacher supervised projects is in effect. Young farmer and adult classes are helping to provide training for farmers, but there appears to be a need for higher enrollment in high school vocational agricultural classes if we care to prepare boys to farm efficiently.

Virginia will be faced with a serious problem of inadequately trained farmers in the near future unless vocational guidance becomes more efficient. In spite of the trend toward fewer farmers, statistics indicate that the number of high school boys leaving school or graduating, with at least one year of vocational agriculture, is far less than the estimated number of farmer replacements needed annually within the state.¹⁶ Studies indicate that boys who have had vocational agriculture in high school do considerably better in an agricultural curriculum in college than do those who have not taken vocational agricultural courses in high school, and as well as or better in a non-agricultural curriculum.

There are four major business education programs in operation in Virginia; in-school, post-high school, adult evening school and vocational office training.

Due to the increasing use of electronic data processing equipment, the nature of clerical training will require change. Routine jobs will decrease and the trend in years ahead will be toward the up-grading of office workers. The principal emphasis is expected to shift from the training for routine clerical tasks to the training of highly skilled young people as programming specialists in the use of electronic machines.

The purpose of distributive education is to prepare people for profitable employment in the distribution of goods and services to the public.¹⁷ As in other vocational education fields, distributive education provides training for both high school students and adults.

The importance of distributive education can be seen from these statistics. In the period 1950-56, employment in distributive occupations increased 34 per cent in Virginia, 80 per cent higher than the national rate in that period. In 1957, 38 per cent of the total employment in Virginia was in the field of distribution.

More communities are becoming aware of the value of distributive education. Some students of average ability have entered distributive education and have been motivated to do better in all areas of their school work. Adults who have attended small business clinics have requested more of this type of instruction in our schools.

The purpose of home economics education is to assist high school pupils to be effective members of their parental families and to prepare for future responsibilities in establishing their own homes. It is important for people to know how to budget and to use their family income to provide food, clothing, and shelter.

Education in trades and industry, as in other vocational fields, serves two purposes. As part of general education it prepares boys and girls to live in a world which is rapidly becoming industrial and technological and it prepares students for gainful employment in trades and industry.

There are various programs offered in trades and industrial education; in-school day trade classes, evening trade extension classes, apprenticeship training classes and part-time cooperative, or diversified, occupations.

Diversified occupations education is becoming a more important field, and students have enrolled in classes teaching skills in over two

¹⁶ "Dr. Paschall Addresses V: V.A.," *Virginia Vocational Education News*, December 1957, pp. 1, 2, 4.

¹⁷ *Coordinator's Handbook for Distributive Education*, State Board of Education, Richmond, 1955

hundred occupations in Virginia. Advantages of the diversified occupations program include training on industrial equipment that would be too expensive to install in schools, keeping abreast of occupational trends, holding power that encourages students to stay in school, and training in job situations. The school, the cooperating industry, and especially the student benefit from the diversified occupations program.¹⁸

In many parts of the state there is an increasing demand for technicians and laboratory assistants. The technological training that industry is requesting cannot, in many cases, be completed in high school so that there is a trend toward certificates in technical training at a level of two years post-high school.

It is imperative that guidance personnel realize the potential of vocational education. The distribution of occupations in Virginia indicates that further study in guidance and vocational education would be helpful in revealing how a student's education might become more effective.

It is suggested that follow-up studies on vocational education students, such as the annual, five-year, and ten-year studies in distributive education be carried out in all areas to test the effectiveness of the programs and to determine areas for improvement.

B. TEACHER CERTIFICATION

As was mentioned earlier in this report, the modification of requirements for certification of teachers by the State Board of Education, effective July 1, 1960, by (1) increasing the requirements for more courses in subject matter to be taught and in general education, and (2) decreasing the course requirements in professional education, is in our opinion a step in the right direction. The new certification requirements, however, while holding promise of improvement in the future, do not meet the immediate and urgent need to improve the quality of instruction *now*. Although teachers in the public school system on July 1, 1960 are exempt from the new certification requirements, they should be encouraged and assisted in reaching the new standard at the earliest practicable date. The State must and should provide financial assistance to teachers who desire to meet the new certification standards and in the following section, "Teacher Training," we have set forth the means by which it can be accomplished.

The Code of Virginia makes an exception to the professional education requirements for teacher certification in § 22-204:

"...provided that any teacher, holding a degree from a four-year accredited college or university, whether in a public or private school, who acquired two years of teaching experience which is certified to be satisfactory by a division superintendent of public schools or by a principal or equivalent officer as to private schools, shall be deemed to have met requirements for having the collegiate certificate raised to college professional, without being required to take more than nine semester hours in professional education, which hours may be waived or appropriately modified in the administrative discretion of the State superintendent of public instruction upon the recommendation of the Division superintendent of schools."

¹⁸ *General Information Pertaining to the Operating of a Diversified Occupations Program*, The State Board of Education, Division of Vocational Education, Trade and Industrial Education Service, Richmond, 1957.

This section was amended by the General Assembly in 1958 and although it has been used in only a few instances to waive all professional education requirements, it has proved useful in certain cases and has prevented a too rigid application of the certification requirements.

The State Board of Education and the various State teacher training institutions are requested to observe carefully the effect of the new certification requirements during the next biennium with a view toward determining whether a further increase in required academic subjects is justified.

C. TEACHER TRAINING

No matter how fine the buildings or how broad the scope of the curriculum, in the final analysis the excellence of education is primarily dependent upon the quality of teaching. The Commission has devoted more attention to ways and means of immediately increasing the overall quality of teaching in Virginia than to any other single problem. We are acutely aware that the higher curriculum requirements adopted by the State Board of Education in 1958 cannot be effective if they are beyond the present capabilities of our teachers. In a world of rapid changes and startling new developments effected by the giant strides being made in science and technology and which are affecting our manner of living, vocations, professions, and in fact, every aspect of our daily life, our teachers have a tremendous problem to keep abreast of the advances in both content and method in many of the subject matter fields.

Improving the quality of instruction is not only the problem of the teachers. It is also the problem of the State. We therefore urge that financial assistance be specifically provided for raising the quality of teaching. We are confident that most of our teachers have a genuine desire to improve themselves in their profession.

Summer courses at State institutions of higher learning, regional classes with instructors from such institutions and home study courses prepared and supervised by these institutions are presently available. Positive steps should be taken to expand each of these methods of instruction.

Our studies have indicated a need for coordination of the efforts of the various state institutions of higher education to provide regional classes, workshops and institutes for teachers. If this program is expanded, as it should be, the need for coordination will increase proportionally. The Council of Higher Education appears to be the logical coordinating agency.

In the critical areas of science, mathematics and foreign languages, we have previously pointed out that not only do teacher shortages exist, but the recent changes in teaching methods and course content have made it mandatory that teachers in these fields be upgraded through additional study.

The Commission is aware, as mentioned in the section on "Science," that some of the State institutions of higher learning are now offering summer institutes in science and mathematics under the sponsorship of the National Science Foundation. It is our hope that more of our colleges will seek to qualify under this program. We urge teachers to take advantage of these opportunities. However, the number who may attend is strictly limited while the number who should be given an opportunity is large.

We therefore propose that the State Department of Education arrange for a number of special teacher institutes in 1960 and 1961 at the State institutions of higher learning. The summer institutes should offer programs with credit in the critical fields of science, mathematics and foreign languages. It is suggested that six institutes should be provided in 1960 and that this number be doubled in 1961. The tuition of teachers attending these special summer institutes should be borne by the State.

Increased emphasis and a stepped-up program of regional classes for teachers under the auspices of the institutions of higher learning is also needed. For teachers taking courses in these regional classes in their subject matter fields and/or to meet 1960 certification standards, the State should likewise assume the cost of tuition.

An incentive is now offered by many localities for teachers to work toward a masters degree even though the degree is not necessarily related to the field in which the teacher is presently teaching. As teachers improve themselves professionally by taking additional courses in their subject matter fields, or in additional subject matter fields for which they are preparing themselves and in which they would be willing to teach, the State should provide them with extra compensation. No attempt is made to set up a detailed plan for the execution of these proposals as we believe this can be done more effectively by the State Board of Education. We are convinced that acceptance of these recommendations will be a most important step in assisting teachers to improve the quality of instruction and to meet the heavy demands upon them.

It has come to our attention that such information relating to the field of education which would be helpful to teachers is not coming to their attention. There is presently no central source where complete information is readily available as to studies completed or in progress in the colleges, universities, school divisions and school agencies which affect education. We suggest that the post of Coordinator of Research be created in the State Department of Education with responsibility for the collection and dissemination of information to teachers relating to educational research.

Elsewhere in this report we have suggested that school authorities in the various localities make strenuous efforts to recruit persons who have the educational qualifications to teach, but are not presently teaching. Special provision should be made for these persons as they reenter the teaching field. To this end we suggest that special refresher courses and training be provided by our institutions of higher learning. These special courses should be offered in the summer at State institutions of higher learning, in regional classes with instructors from such institutions and by home study groups directed by the institutions of higher learning. An additional appropriation for this purpose is recommended.

The current scholarship plan to assist future teachers was established by the General Assembly in 1947 at which time scholarship loans were made available to Virginia students taking courses leading to teaching.

To assure a supply of teachers for the increasing requirements of the future we recommend that the State scholarship program receive a substantial increase of funds. We think that at this time preferred consideration should be given to those prospective teachers who are preparing themselves to teach in the critical areas of science, mathematics, English and foreign languages.

D. TEACHER RECRUITMENT

All available evidence indicates that the shortage of teachers in the coming years will increase progressively unless steps are taken to attract more and better qualified people into the teaching profession. While the Commission has not fully explored the problems connected with teacher recruitment, our investigation thus far has pointed up certain things. For example, it was brought to our attention that American teachers have the lowest position of prestige among the major nations of the world.

Status is to a degree related to income. Continued improvement in teachers' salaries in Virginia will not only attract capable people but will serve to retain competent teachers in the profession. Localities which have faculty shortages in critical subject areas cannot hope to attract competent teachers for less than reasonable compensation. Here, local community attitudes play a large part. Only by giving the teacher a position of prestige and status in the community will the best qualified young people be attracted to and held in the teaching profession.

Then too, the attitude of teachers toward their own profession either attracts or discourages young children to consider teaching as a profession. At the college level a great deal of help can be given. College teachers and administrators can do much to help guide students into teaching—provided the teachers and administrators have a personal love and respect for the teaching profession.

In another portion of the report we have mentioned scholarships. It is sufficient to say here that the state scholarship program for prospective teachers must be expanded.

The 1957 V.A.L.C. report on engineers and scientists recommended:

“Utilization of qualified professional people from industry to assist in teaching and in the on-the-job training of teachers.”

Some school systems in the State have followed this recommendation and are using persons from the community at large as part-time teachers to relieve shortages in critical subject matter areas, e.g., science, foreign languages and mathematics. A survey by other local school divisions might disclose a number of persons not now teaching but who may be capable of teaching subjects after having received refresher training as suggested in the section entitled “Teacher Training.” The several school divisions should enlist the aid of local industry and make an intensive effort to recruit such persons.

E. SUBJECT SUPERVISORS

As set forth in the sections on science, mathematics and foreign languages, there is a need for more active leadership and assistance to classroom teachers from the State department level and through subject supervisors. We recommend that the State Board of Education consider the employment of a number of subject supervisors in the fields of English, science, foreign languages, mathematics and social studies (history, government, geography, economics). These persons should be highly trained in their subject matter fields and should be especially proficient in teaching. While not attempting to outline specifically the scope of their employment, we suggest that they could visit schools throughout the State, occasionally teach classes, conduct experiments in science and generally advise and consult with teachers individually and in regional meetings. The Commission recognizes that the areas in which these

subject supervisors would be most helpful are the smaller secondary schools, and it is in this area that help is most needed. Provision for the subject supervisors should be made in the appropriation for the Department of Education.

F. TESTING

The use of aptitude and achievement tests has greatly increased in recent years in schools throughout the United States. Standardized tests for achievement and aptitude have been devised for pupils from the primary grades through the college level and there has been an accumulation of experience in the analysis and interpretation of these tests.

In Virginia the use of testing varies with the local school division, however, an increasing number of localities are administering standard tests to serve class needs for grouping and other instructional purposes. As greater use is made of standard testing for guidance and other purposes it becomes necessary to provide test scoring equipment at various points in the State for a prompt and effective analysis of test results rather than having this work centered in Richmond. Additional equipment is needed wherever the tests are scored. We recommend that the State provide this equipment to be located at places reasonably convenient to all school divisions.

In 1959 the General Assembly appropriated money for the State Department of Education to give an aptitude test and an achievement test to all pupils in the public schools in Virginia in the school year 1959-60. The result of these tests will be computed by the State Department of Education. These or similar tests might be given periodically throughout the public school system of Virginia and be analyzed to assist in locating classes where pupils are not making satisfactory progress. The State Department of Education could offer its assistance to the teachers and local school divisions involved. We believe this approach has great merit. Therefore, this Commission recommends that uniform achievement tests be given to all pupils in the public school system in Virginia. Such tests should be varied so as to be appropriate to the different grade levels. We further recommend that the interpretation of these tests be done carefully and be compared, class by class, among children of similar schools, taking into consideration economic, geographic and cultural backgrounds of the children as well as the I.Q. of the child insofar as I.Q. can be discovered by other tests. This testing should be carried out by local school divisions under instructions from and analysis by the State Department of Education.

Upon making findings from such tests we believe that it may be possible to ascertain classes where children are not progressing satisfactorily and classes where they are showing the greatest progress. The State Department of Education should then seek the reasons for the lack of progress in certain classes and should, on a consultation and advisement basis only, work with the teachers whose classes are not showing satisfactory progress. Conversely, we may be able to learn something of the reason for classes which show exceptional progress.

It may be that our recommendations can be carried out by use of the uniform tests which are being given statewide in 1959-60, provided sufficient information is available to make the interpretations we have proposed. In any event, we believe that the kind of tests described should be continued on a periodic basis for each class in Virginia every few years.

G. GUIDANCE

The V.A.L.C. Report on Education of Scientists, Engineers and other Specialists in 1957 recommended to the Department of Education:

“Encouragement of the installation or improvement of guidance programs in all high schools, so designed that the opportunities for careers in science and engineering and the aptitudes of children therefor are given importance.”

We concur in this recommendation and further urge the utilization of sufficient guidance so that students and their parents may make an intelligent choice early in the high school career of the program the student will follow. This requires that relevant information and consultation as to the high school programs available, the opportunities in all the various academic and vocational fields, as well as science and engineering, and suitability of the high school programs therefor be given to the students and their parents for consideration along with the interest, aptitude and ability of the student.

Guidance will be especially useful as the five-year high school curriculum comes into effect under the recent regulations of the State Board of Education because, to cite one example, a student at the beginning of his first year of high school (same as the eighth grade) must arrange his program at that time if he is to take advantage of the advanced work to be offered in the last year of high school.

In order to have effective guidance we believe that it is desirable to have available personnel in the high school with specialized training in guidance and with sufficient time for this work. Only a few high schools in Virginia are at present in this position. Therefore, we recommend the creation of additional guidance positions immediately in sufficient number to service all of the school divisions in the State. We further recommend institutes for guidance training be conducted in the summer of 1960. Appropriations should be made for these purposes.

We suggest the following in the interest of effective guidance: (1) Students should be graded on the basis of definite standards of performance in the subjects taken so that their ability and aptitude in certain fields may be more readily determined rather than being graded on the basis of individual effort and motivation. (2) At least some of the instruction at guidance institutes should be given by qualified persons in the various fields, e.g., science, engineering, liberal arts, agriculture, etc., as they would be most familiar with requirements of their respective fields.

This Commission is aware of the need to challenge fully and to develop the academically talented student. One of the natural results of a properly administered guidance program would be the channeling of the academically talented student into programs of study wherein his capabilities would be fully realized.

H. EXTRACURRICULAR ACTIVITIES

Extracurricular activities have become a constantly increasing factor in the modern high school. This development was the subject of the following comment in the report of the Commission on Education to the Governor, dated March 31, 1959:

“In studying this matter, the Commission was appalled over the extent to which extracurricular and social activities have grown and

developed throughout our public school system. Undoubtedly, in some instances, this multitude of activity has reached the point where it is beginning to supplant and impair fundamental learning." (Report pg. 16)

A statement of policy, adopted by the State Board of Education on December 11, 1958 included:

"Extracurricular activities should be under the direct supervision of the school and should supplement the regular classroom program. The justification for such activities rests upon the extent to which they contribute to the fulfillment of the purposes of the high school. They must be evaluated periodically, and so organized and administered that interruptions of the classroom program are kept to a minimum. Pupils should not be permitted to engage in these activities to the point that they interfere with regular classroom work."

In May, 1959, the State Board of Education requested Division superintendents and local school boards "to review extracurricular activities, and meetings and conferences (involving teachers and pupils) with a view to . . . eliminating those not regarded as justified for continuation . . . " A summary of extracurricular activities and meetings permitted in some seventy school divisions was completed in October, 1959.

On October 22, 1959, the State Board of Education adopted this further statement:

"It is recognized that the basic responsibility of the school is to provide sound instruction for boys and girls eligible to attend.

"It is further recognized that certain meetings and conferences involving teachers and/or pupils, and certain extracurricular activities contribute significantly to the educational purpose of the school. Those that do not, or are permitted to interfere with the regular classroom program should be reorganized or eliminated.

"In the time-honored tradition of American education, the duly constituted local school authorities are the basic determiners of what is best for their school system. The State Board of Education respects this fundamental principle, and has every faith that the division superintendents and school boards who are constitutionally charged with 'supervision of the schools' will make appropriate decisions in the matter of conferences and extracurricular activities involving teachers and/or pupils."

At the same time the Board established the following as one of the standards for accreditation of a high school:

"Extracurricular Activities. The high school's extracurricular activities (including athletic events) and the time and place of such activities must have the approval of the local school board in accordance with the policy adopted by the State Board of Education, and a complete list of these activities showing date of approval, and signed by the chairman of the school board, must be submitted as a part of the Preliminary Annual High School Report."

This Commission concurs in the policy stated by the State Board of Education in the foregoing quotations and believes that the action taken by the Board will result in a necessary reappraisal of the character and number of extracurricular activities permitted in the public schools. How-

ever, the total effect of extracurricular activities upon the schools and the student results not only from the character and number of such activities, but also from the attitude and sense of relative values in the thinking of the students, sponsors and school patrons.

Extracurricular activities should be classified generally as classroom-connected activities and school-connected activities. The classroom-connected activities should include clubs such as Science, Latin, Math, English, etc. The Commission is of the opinion that class-connected activities should supplement the classroom program and insofar as possible be related to regular classroom work.

The school-connected activities are the type of extracurricular activities which more directly affect the school as a whole, i. e., athletics, the year book, etc. These activities should be under the careful supervision of classroom teachers and principals and except in rare cases should not infringe on school time.

It is therefore necessary not only to limit the number and character of such activities, but also to recognize the duty of the school, its principal, teachers and coaches, and of parents to emphasize to the student the incidental and subordinate nature of school-connected activities and the greater importance of the regular curriculum.

By adherence to the above policies, the classroom would suffer few interruptions during the regular school day, teachers would have fewer extracurricular responsibilities, classroom work would be strengthened, and the school made more worthy as an institution of learning.

The School Board in each division should evaluate these activities from time to time in order to ascertain the extent to which they implement the philosophy and objectives of the school.

Present requirements for eligibility for participation in interscholastic competition do not appear to be consistent with the educational policy of the State, as above expressed. The Commission is of the opinion that consideration should be given to the establishment of a higher minimum standard of academic achievement as a requirement throughout the State of eligibility of any student to represent his school in any competitive interscholastic activity. Such requirement would not prevent any student's participation in any competitive activity within his own school or in any noncompetitive activity at any place. The requirement would emphasize, in a manner impressive to students of all ages, the real purpose of the school and the greater importance of education itself.

I. CONSOLIDATION OF HIGH SCHOOLS

The High School Act of 1906 gave approval by the General Assembly of Virginia to public high schools. By 1912 there were 112 accredited high schools in Virginia, and by 1937-38 there were 468. The O'Shea Survey, second of our statewide school surveys to be initiated by the General Assembly, contained as one of its recommendations that more and more wise consolidation of schools take place as good roads increased in Virginia.¹⁹

In 1944, the subcommittee of the Denny Commission assigned to study consolidation of schools reported the following:

"It is obvious that we cannot continue to operate the small inefficient high school units as either one of two results must follow.

¹⁹ *Report of a Survey of the Public Educational Systems of the State* (O'Shea Report—1928)

Either the educational offering must be entirely too restricted and limited, or the per pupil costs will be exorbitantly high.”²⁰

In his widely quoted book on American High Schools, Dr. James B. Conant drew essentially the same conclusion, and states that the small high school is the number one problem in many states today.²¹ The rule of thumb used by Dr. Conant to judge whether or not a high school is large enough to offer the type of comprehensive program needed is that the graduating class should number at least 100 students. In 1958 only 65 of Virginia’s high schools had as many as 100 graduates.

An examination of the size of high schools in Virginia over a twenty year period reveals great improvement toward consolidation, especially during the past ten years.

Table III
The Number and Size of Enrollment in the Accredited
High Schools of Virginia over a 20 Year Period

Number of pupils Enrolled in High School Department	Number of Schools 1937-38	Number of Schools 1947-48	Number of Schools 1957-58
35- 50	15	—	—
51- 75	83	17	7 (75 & under)
76- 100	87	64	16
101- 150	118	102	31
151- 200	57	55	43
201- 300	55	82	77
301- 400	53 (301 & over)	92 (301 & over)	54
401- 600			67
601- 800			40
801-1100			25
1101-1400			22
1401-and over			37
Total	468	412	419

Source: *Annual Reports of the State Superintendent of Public Instruction*, Richmond, Virginia.

Previous study groups in Virginia which have been concerned with various aspects of education have pointed to the small high school as a weak spot in Virginia’s educational system. The critical subjects covered in earlier sections of this report such as science and foreign language require special facilities and better trained teachers than are available in most small high schools. One recent study observed that many public high schools do not provide the basic training in critical area subjects required for successful completion of college courses in science and engineering.²² Either the subjects are not offered or of such inferior quality as to be almost useless. The Commonwealth, then, is losing a priceless resource of properly prepared students who might go on to college for advanced study

²⁰ *Report of the Virginia Education Commission* (Denny Commission—1944) p. 124

²¹ *The American High School Today*—Conant

²² V.A.L.C. Report, *Education of Scientists, Engineers, and Other Specialists*. Commonwealth of Virginia, 1957, p. 13

in these critical areas. This is because many public schools, due to a lack of financial ability and a lack of an adequate supply of qualified teachers, are not able to give high school students the courses they need in these fields.²³

The Virginia Education Facilities Committee in its study just recently completed, also points to a special problem which arises from the existence of schools too small for effective use. Even if a small high school of 150 pupils had an adequate science laboratory it would be used only three hours a day by as few as seven or eight pupils each hour. This is only 15 per cent utilization of a costly facility.²⁴ The per capita cost of instruction is staggering! This inefficiency is also often repeated in other special facilities of the small high school, such as those required for homemaking and shop.

The 1957-58 Annual Report of the Superintendent of Public Instruction gives figures on the per capita cost of instruction by size of enrollment for Virginia accredited high schools. This is shown in Table IV below:

TABLE IV
Relationship Between Per Capita Cost of Instruction
And the Size of Enrollment in the Accredited High Schools
Over a Three-Year Period

Number of Schools			Number of Pupils Enrolled in High School Department	Per Capita Cost		
1955-56	1956-57	1957-58		1955-56	1956-57	1957-58
14	7	7	75 and under	\$249.62	\$258.59	\$291.65
19	14	16	76- 100	227.40	258.04	256.08
33	38	31	101- 150	204.45	210.16	238.04
51	32	43	151- 200	174.35	196.28	208.03
80	75	77	201- 300	178.58	182.41	195.77
54	57	54	301- 400	170.01	172.49	192.40
62	77	67	401- 600	166.76	182.43	195.46
40	32	40	601- 800	188.58	183.71	195.27
25	31	25	801-1100	173.68	190.45	199.95
18	17	22	1101-1400	190.21	201.49	201.66
27	32	37	1400 and over	203.50	216.34	230.07

Note: The per capita cost of instruction was not shown for six schools for the school session 1955-56. The per capita cost of instruction was not shown for five schools for the school session 1956-57.

Source: *Annual Report of the Superintendent of Public Instruction*, Richmond, Virginia, 1958, p. 35.

The Table above shows that the per capita costs ranged from a high of \$291 for schools of 75 or under, to a low of \$192 for 301 to 400 pupils. The per capita cost does not vary much as schools increase in size until they get over 1400 pupils. Such increase as there is, probably results because of more extensive offerings and higher salaries paid to teachers.

For over thirty years, study commissions have brought to the attention of the people of Virginia the cost and inefficiency of small high schools. This Commission has sought to do so again.

J. SUMMER SCHOOLS

Much attention has been given in recent years to the possibility of extending the school year, or of operating schools on a four quarter

²³ Ibid.

²⁴ *Virginia Education Facilities Committee*, 1959

basis, in order to make more use of the great investment in school buildings.

The report of the Virginia Education Facilities Committee, dated April, 1959, included the following recommendation:

“Summer schools should be established much more widely—for enrichment, for acceleration, and for making up failed work. They make for improved use of the state’s investment in educational facilities. They should be financially supported by the state to the same extent as schools which operate during the regular nine-months session.”

A tabulation on summer school operations in the years 1955 and 1959 reveals a marked increase in attendance:

	Summer 1955	Summer 1959
Number of high schools operating summer schools	79	112
Number of pupils enrolled	11,522	27,007
Number of pupils taking new courses only	5,240	11,841
Number of pupils taking new and repeated courses (combination)	1,822	4,363
Number of pupils taking repeated courses	5,101	12,536

These figures reveal a considerable increase in the use of school facilities on a year-round basis. During the five-year period, the number of schools offering summer school work increased by more than 40% and the enrollment more than doubled. The number of pupils enrolled for only new courses increased over the five-year period by 106 per cent.

The tuition cost varies greatly among school divisions. A large number of reports indicated a charge of \$20 - \$30 per course unit for the 1959 summer session. However, three school divisions (eight schools) made no tuition charge.

This Commission believes there is merit to the proposal that the state participate financially in the operation of summer schools. However, we have not developed sufficient information to determine in what manner and to what degree we would recommend such state participation.

V.

RECOMMENDATIONS

Our study of public education thus far, has led us to make the following recommendations with respect to the public secondary schools of Virginia. They are classified according to the governmental agency having primary responsibility for their execution. We recommend:

A. The General Assembly

1. That special summer institutes for teachers of science, mathematics, foreign language (including Latin), and for guidance counselors be provided in 1960 and 1961 and that tuition costs of teachers attending these institutes be paid by the state.
2. That tuition fees be paid by the state for teachers attending summer schools and regional extension classes and taking home study

courses under auspices of the institutions of higher learning for the purposes of meeting 1960 teacher certification standards and/or further education in their subject matter fields.

3. That positions of "subject supervisors" be created for the Department of Public Education in the fields of English, science, mathematics, foreign languages and social studies (history, government, geography and economics).

4. That the State assist the localities in the purchase of science and foreign language laboratory equipment.

5. That additional guidance positions be provided for the high schools of Virginia.

6. That the post of coordinator of research be created in the Department of Education to collect and disseminate to teachers and school administrators information as to studies completed or in progress in the colleges, universities, school divisions and state agencies which affect the field of education.

7. That the scholarship program for teachers be expanded substantially.

B. The State Board of Education

1. That plans be formulated to provide increased compensation for teachers who have taken additional courses in their subject matter fields, or in other subject matter fields for which they are preparing and in which they would be willing to teach.

2. That high school students be taught elementary economics with emphasis upon the significance and workings of the traditional free enterprise system in the United States as the basis of our economic development.

3. That consideration be given to the establishment on a state-wide basis of a higher minimum standard of academic achievement as a requirement for students to represent their school in interscholastic competition.

C. The State Department of Education

1. That the Department of Education evaluate history and new "space age" text books in science, mathematics, and world geography, as soon as possible and exert pressure on publishers to produce up-to-date text books.

2. That the current program for testing the achievement of children in the public schools be continued; that the results be evaluated by the Department of Education to determine those divisions where achievement is low with a view toward assisting in overcoming any deficiencies; and that equipment be provided for scoring tests which equipment would be located in regional offices throughout the state.

3. That follow up studies on vocational education students be carried out at periodic intervals to test the effectiveness of the program and to determine areas for improvement.

D. The Council of Higher Education

1. That the efforts of the state institutions of higher education to provide regional classes, workshops and institutions for teachers be coordinated through the Council of Higher Education.

E. The Institutions of Higher Education

1. That teacher training institutions give instruction in foreign languages in the "new method" and offer majors in foreign languages.
2. That institutions of higher education seek to qualify for and conduct summer institutes both for children and for teachers under the sponsorship of the National Science Foundation in the fields of science and mathematics.
3. That institutions of higher education orient college laboratory courses for teachers toward preparing them to teach high school laboratory science.
4. That institutions of higher education devise for prospective teachers special courses in such areas as modern algebra, geometry (other than Euclidean), statistics and analysis; and advanced seminars in the problems of secondary education and the teaching of mathematics.

F. The Local School Divisions

1. That school boards give careful consideration to the advantages accruing from the consolidation of small high schools and that such schools be consolidated at the earliest practicable date.
2. That school boards take positive steps to implement the recommendations of the State Board of Education respecting extracurricular activities.
3. That school administrators coordinate and supervise the five-year program of English instruction in the high schools to assure that no vital areas are omitted from the pupil's preparation, especially English composition.
4. That school administrators take into consideration the class size and the total teaching load of teachers of English composition in assigning them classes and supervision of extra curricular activities.
5. That school boards and school administrators strive to provide in their curricula not less than three years in any foreign language taught, and that students be encouraged to take not less than three years of any foreign language.
6. That school boards and school administrators consider the employment of interested high school students as laboratory assistants with nominal remuneration.
7. That the several school divisions make an intensive effort to recruit for teaching those persons in their respective communities who are academically qualified but are not now teaching.
8. That the several school divisions seek the aid of industry in providing facilities, instruction, part-time employment for science teachers and/or talented students, and assistance in continuous evaluation of instructional programs.
9. That school administrators offer courses in driver training in the summer schools and on Saturdays, rather than during the regular school days.

VI.

CONCLUSION

This report should not close without a further mention of the favorable attitude toward education in Virginia which the members of the Commission have observed. This is one of the most hopeful conclusions drawn from our entire study.

The State Board of Education has made progress toward strengthening teacher certification standards and improving the high school curriculum. Local school systems also are striving to improve the over-all quality of instruction. Citizens at the local level likewise seem genuinely interested in providing better educational opportunities. These are definite signs of progress.

Yet we must inject a note of caution. Every child in Virginia ought to be afforded the best education which it is possible to offer. That goal we have not reached. Nor can that kind of education be provided by the public schools alone. Family, church and school share jointly the responsibility for education. Too often families rely on the schools for the discovery and development of qualities in the child which can best be developed in the home. Then too, a serious question arises as to whether we adult citizens are demanding enough of ourselves or of our children. In the final analysis what the people of Virginia want will shape the future of our educational program. Neither legislators, nor school administrators, nor teachers, but parent-citizens will finally determine the excellence of public education in Virginia.

The Commission has said before that it is confident teachers want to improve themselves in their profession. We have concluded that the State has an obligation to help them in this direction and we have made recommendations for providing such help. In fact most of the recommended appropriations are for this purpose.

The critical areas, science, mathematics, English and foreign languages, need immediate strengthening. Up-grading teachers through special courses and provision of mechanical aids, better science laboratory equipment, and foreign language laboratories are in our opinion an answer and we have translated our conclusion into specific recommendations.

But much more remains to be learned if a thorough and meaningful evaluation of public education is to be made. As yet the Commission has not had an opportunity to study the field of elementary education, nor has it completed its study of many other subjects related to public education. We have therefore listed as the last portion of this report some of the subjects which in our judgment should be given further study.

1. A thorough appraisal of the elementary schools.
2. The possibilities of merit as a factor for determining teacher salary scales.
3. A study of the adequacy of school library facilities.
4. The relative importance of health and physical education in the curriculum.
5. The role of the Commonwealth in the education of physically and mentally handicapped children.

6. The advisability of State financial assistance for summer schools.
7. An evaluation of teacher efficiency under present teacher loads.
8. An evaluation of the adequacy of the present school day, school week and school year.

Respectfully submitted,

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APPENDIX I

Statement of Policy ¹ Regarding Virginia High Schools

The home, the church, and the school are basic institutions responsible for the development of our children. These three along with other community resources must share this responsibility, and the extent to which they are continually strengthened determines the quality of our citizenry.

THE HIGH SCHOOL

Purpose of the High School. The purpose of the high school is to provide for thorough preparation in the academic areas for all pupils, limited only by their abilities and ambitions. Preparation for college must be a primary goal for those planning and capable of pursuing such a course. Opportunity must be provided for pupils not continuing formal education beyond high school to prepare for successful entrance into the world of work.

In achieving these objectives, emphasis should be given to helping all students acquire a desire for knowledge and a respect for learning; an appreciation of the importance of physical and mental health; an understanding of our cultural heritage and a respect for our country; a sense of responsibility for effective citizenship; and good moral character and an appreciation of spiritual values.

Selection of High-School Programs. In achieving this purpose, local school authorities are free to utilize their resources for the best education of the pupils in their charge. A system which requires regimentation of students within inflexible curricula patterns is not desirable. Unrestricted freedom of choice, however, in the selection of courses is not educationally sound for youth of high-school age.

Local school authorities should organize high-school courses into specific programs, such as Academic, Vocational, and General. After careful consideration of these programs by the student, in cooperation with guidance personnel and school administrators and with parental understanding and consent, a specific program should be selected by the student. The pupil should follow the program selected unless it is modified by agreement of school authorities and the pupil's parents. High standards of achievement must be expected in all programs. A sound guidance program is necessary to the wise selection of such programs.

*Graduation Requirements.*² A high school which is a part of the twelve-year school system shall require for graduation 20 units and the equivalent of two and one-half years of health and physical education. The type of health and physical education program is a matter of determination by the policy-making body of the school division in terms of the needs and abilities of the students. Of the 20 units, at least 16 shall be required in ninth-, tenth-, eleventh-, and twelfth-grade subjects.

¹ This Statement of Policy was adopted by the Virginia State Board of Education, December 11, 1958. The graduation requirements set forth in the statement become effective for pupils enrolled in the eighth grade for the school session 1959-60.

² A high school which is a part of the eleven-year school system shall require for graduation 16 units, and the equivalent of two years of health and physical education. The type of health and physical education program should be determined by the policy-making body of the school division in terms of the needs and abilities of the pupils. The following are specified for all pupils seeking graduation: English—4; Math—1; Laboratory Science—1; Virginia and U.S. History—1; Virginia and U.S. Government—1; and World History and/or Geography—1.

Within the total of 20 units, the following 16 are specified for all pupils who seek graduation:

	Unit
English	5
Mathematics	2
Laboratory Science ³	2
Virginia and U. S. History	1
Virginia and U. S. Government	1
World History and/or Geography	1
Additional units selected from a specific program	4

Qualified eighth-grade pupils should be permitted to begin, for example, a foreign language or algebra. This is a common sense procedure for placing those pupils in courses which promise to be of greatest benefit and of maximum intellectual stimulation; for making it possible for them to pursue certain advanced subjects in grade twelve; and for allowing pupils in justifiable instances to graduate in less than five years.

A school receiving a transfer pupil from a twelve-year school system may permit such a pupil to graduate upon completing 16 units in the last four years. The distribution of these units should be made with due recognition to the pupil's previous record and the graduation requirements of the receiving school.

The transcript of a pupil who graduates or transfers from a Virginia high school which is part of the twelve-year system shall clearly show that 20 units including at least 16 in ninth-, tenth-, eleventh-, and twelfth-grade subjects are required for graduation.

Scope of the Curriculum. For purposes of accreditation, a public high school of a twelve-year school system must provide during a five-year period, 34 units of which 22 shall be in academic courses and the remaining 12 in the fine and practical arts. The determination of specific courses beyond those subjects required of all pupils rests with the policy-making body of each school division.

Extracurricular Activities. Extracurricular activities should be under the direct supervision of the school and should supplement the regular classroom program. The justification for such activities rests upon the extent to which they contribute to the fulfillment of the purposes of the high school. They must be evaluated periodically, and so organized and administered that interruptions of the classroom program are kept to a minimum. Pupils should not be permitted to engage in these activities to the point that they interfere with regular class work.

Meetings and Conferences. Every effort should be exerted to hold conferences involving teachers and/or pupils after school, or on non-teaching days, or during the summer. All agencies, organizations, and associations that plan events and meetings and the local school authorities are requested to respect this policy insofar as may be practicable.

³ General science may be counted as one unit. In those instances when general science is not offered as a laboratory course, it should be so organized as soon as possible.

SUMMARY OF MAJOR CHANGES REFLECTED BY STATEMENT OF POLICY

Present Requirements	Modifications
1. Sixteen units are required for graduation.	Twenty units will be required for graduation, at least sixteen of which shall be earned in ninth, tenth, eleventh, and twelfth-grade subjects. Within the twenty units, the following will be required for all pupils:
2. Of the sixteen, the following are specified for all pupils:	
English4	English5
Mathematics1	Mathematics2
Laboratory Science1	Laboratory Science ⁴2
Virginia and U. S. History1	Virginia and U. S. History1
Virginia and U. S. Govern- ment1	Virginia and U. S. Government 1
	World History and/or Geog- raphy1
	Additional units selected from a specific program4
3. In addition to the sixteen units, three years of health and physical education, grades 8, 9, and 10, are required.	In addition to the twenty units, the equivalent of 2½ years of health and physical education, grades 8-12, will be required.
4. Qualified eighth-grade students are not permitted to take advanced subjects with credit except by special permission of the State Board of Education.	Qualified eighth-grade students will now be encouraged to take such subjects as foreign language, algebra, and advanced science.
5. For purposes of accreditation, thirty units are required which must be distributed as follows: Academic subjects—18; fine arts—2; and practical arts—10.	For purposes of accreditation, thirty-four units will be required. Twenty-two of which must be in academic subjects and the remaining twelve in the fine and practical arts areas.

Although many high schools have organized their offering in specific programs, this policy statement definitely encourages that practice.

Under this policy, the eighth grade is made a definite part of the five-year high school involving credit and affording opportunity for qualified students to take advanced work.

This statement sets forth a policy with regard to delimiting extra-curricular activities, and the holding of meetings and conferences on school days.

⁴ General science may count as one unit.

APPENDIX II

Recommendations by the Commission's Study Staff relating to the teaching of Mathematics.

- a. Mathematical facts and processes should be learned with understanding and meaning and not in a rote fashion.
- b. Learning situations in which the student memorizes, or even learns with understanding, the development of mathematics made by a teacher or a textbook should not be used exclusively. There should be learning experiences which encourage the student to do his own development, to make discoveries of relations and facts on his own, and to look for and develop many ways of solving a problem rather than to learn one set pattern given by a teacher or a textbook.
- c. There should be a better balance between the study of the applications of mathematics and the study of mathematics itself.
- d. Overemphasis on computation should give way to a better balance between an understanding of the concepts of mathematics and the skills of mathematics necessary to develop and work with those concepts.
- e. Schools should make better provisions for individual differences, through sectioning, regardless of whether the same or different content is used. This is particularly true in providing for academically talented and gifted students. There is little doubt but that the near future will see as extensive a development nationwide of special opportunities for these children as are available now for the slow and mentally or physically retarded.
- f. Programs which present mathematics as isolated topics and courses should give way to programs in which mathematics is presented as an integrated subject. The sharp distinctions among the high school courses, algebra, plane geometry, solid geometry, and trigonometry, are being broken down somewhat and a better integration of the topics and courses achieved.
- g. Instruction which leaves the student with the feeling that mathematics has long since been completely developed and embalmed in textbooks should be replaced with approaches which present mathematics as a living, growing subject.

Observations by the Commission's Study Staff relating to the mathematics curriculum.

- a. A larger introduction to or perhaps a full year in elementary algebra for capable eighth-grade students is recommended.
- b. Some programs suggest a change in the orientation of seventh and eighth grade mathematics away from the excessive emphasis on the social applications of the arithmetic the students have already studied toward topics chosen for their value in extending the students' understanding of mathematics. For example, units developed for these grades by the University of Maryland Mathematics Project and the School of Mathematics Study Group carry such titles as: Decimal and Non-Decimal Numeration, Factoring and Primes, Non-metric Geometry, and Approximation. These materials also include some applications of mathematics from the physical sciences as well as those from the "everyday" uses of mathematics.
- c. The equivalent of two years of the upper four in the college preparatory sequence should be algebra. The first year, ninth grade, in the four-year sequence should be elementary algebra; the second year may probably best

be gained, not as a separate course, but as topics in algebra included in integrated mathematics courses for the eleventh and twelfth grades.

d. The topics of algebra would be essentially the same as usual with the following notable changes in new topics and treatment of old topics.

1. Algebra is to be thought of as a study of mathematical structures or patterns rather than solely as a development of manipulative skills, although the latter are important. For example, more attention is to be given to the laws of combination governing the operations on the numbers in the various sets of numbers the child deals with, and relatively less emphasis is to be placed on extensive drill in such items as long and involved fractional expressions and factoring.

2. More stress is to be placed on teaching the concepts of relation and function through the use of ordered pairs of elements. This calls for an early introduction to inequalities and expressions involving absolute value along with the study of equations.

3. More use is to be made of the terminology of set theory and perhaps, although not necessarily, the symbolism of set theory.

4. The use of the idea of solution set as the set of all substitutions for the variable ("unknown") which will make the statement (equation) true statement is proposed.

5. More emphasis is to be placed on graphic representation of relations and functions, and an earlier and wider introduction of ideas which have commonly been called topics of analytic geometry.

e. A wider use of the deductive approach should be provided. Students should be exposed to deduction in parts of their high school mathematics other than geometry, which in the past has been the traditional course for the introduction and use of the deductive approach.

f. Essentially one full year, the tenth grade usually, should be devoted to geometry, with some attention given to solid geometry and some development made of analytic geometry, although the recommendations for the extent to which these latter two should be treated in the one-year geometry course vary widely among the experimental programs and reports. In any event, solid geometry as a separate subject should be eliminated and the essential content of this course distributed throughout the other years of mathematics. The various reports and experimental programs also differ noticeably in their introductions to and treatments of plane geometry in the one-year geometry course.

g. Most reports suggest that trigonometry as a separate course be eliminated and the various aspects of this course be treated throughout the high school program. For example, the solution of triangles may well be placed in the eighth and ninth grades, while the study of the trigonometric functions as periodic functions of numbers rather than angles and their graphical presentation would be treated in the upper two years. Less emphasis would be placed upon logarithms for computation and more emphasis upon logarithms in the study of relations and functions.

h. More emphasis is to be placed upon probability and statistics throughout the high school program.

i. Suggestions for the eleventh grade course include such topics as (a) basic operations with and properties of natural numbers, integers, rational numbers, and real numbers, (b) quadratic equations and quadratic functions, (c) complex numbers, (d) systems of equations—linear, quadratic, and linear-quadratic with graphical interpretation, (e) mathematical in-

duction, (f) the binomial theorem, (g) progressions, (h) exponents and logarithms, (i) plane vectors, and (j) trigonometry, including trigonometric formulas and coordinate trigonometry (rectangular and polar).

j. The twelfth grade course may include a half year of further work with elementary functions—trigonometric, polynomial, exponential, and logarithmic. Alternatives are recommended for the second semester of the twelfth grade. These alternatives include such courses as (a) further work with functions, (b) probability and statistical inference, (c) introduction to modern algebra, (d) or further work with selected topics the student has been introduced to in his previous work.

k. Some of the reports recommend that a student should have three years of high school mathematics for college entrance. This should include one year of geometry and essentially two years of the more important topics of algebra treated along with topics from trigonometry, etc., as described previously for the mathematics courses of the upper two grades.

l. No doubt, there will be considerable variation in the eleventh and twelfth grade courses tried in schools throughout the country over the next few years. In fact a number of different programs are already being taught, particularly in the twelfth grade. This type of experimentation is good. In any event, however, a good four-year program in mathematics on the high school level should prepare a student to enter a course in analytic geometry and calculus as his freshman college mathematics course.