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SPECIAL REPORTS
ON
EDUCATIONAL SUBJECTS.

VOLUME 26.

THE TEACHING OF MATHEMATICS IN
THE UNITED KINGDOM. PART I.

Being a series of Papers prepared for the
INTERNATIONAL COMMISSION ON THE TEACHING OF
MATHEMATICS.



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PREFATORY NOTE TO VOLUME 26 OF SPECIAL REPORTS ON
EDUCATIONAL SUBJECTS.

The present volume is the result of the action taken by the International Congress of Mathematicians at their meeting in Rome in 1908, when, at the proposal of Dr. David Eugene Smith, Professor of Mathematics in Columbia University, New York, it was resolved to appoint an International Commission on the Teaching of Mathematics. This Commission was entrusted with the task of securing a series of Reports on the state and progress of mathematical instruction in various countries of the world.

There were certain difficulties in arranging for the collection of reports in this country, and the Board of Education were approached and asked to give assistance in the matter. The Board were glad to avail themselves of the opportunity which thus presented itself of adding to their series of Special Reports on Educational Subjects a collection of papers dealing with mathematical teaching in this country. In order to assist the Office of Special Inquiries and Reports in the collection of suitable material, the President appointed an Advisory Committee consisting of:—

Mr. C. E. Ashford.
Sir George H. Darwin, K.C.B., F.R.S.
Mr. C. Godfrey, M.V.O.
Sir George Greenhill, F.R.S.
Mr. G. H. Hardy, F.R.S.
Professor E. W. Hobson, F.R.S.
Mr. C. S. Jackson.
Sir Joseph Larmor, F.R.S.
Professor A. E. H. Love, F.R.S.
Professor George A. Gibson.

This Committee acted at the same time as the British Sub-Commission of the International Commission on the Teaching of Mathematics. The Reports which have been secured through their assistance are therefore intended to serve a double purpose; on the one hand they enrich the series of Special Reports, while on the other they serve as the Report of the British Sub-Commission, which will be submitted to the International Congress of Mathematicians meeting in Cambridge this year.

The Board desire to take this opportunity of expressing their cordial thanks to the members of the Committee for the assistance they have rendered, and to the various authors who have contributed papers to this and the accompanying volume. In particular they wish to express their acknowledgment of the

invaluable service which has been rendered by Mr. C. S. Jackson Secretary to the British Sub-Commission, on whom has fallen the main work in connexion with the collection and revision of the papers included in this and the accompanying volume. Mr. Jackson has placed his time and knowledge most freely at the disposal of the Board.

The Board's thanks are also due to the authorities of those Colleges at Oxford and Cambridge who have courteously given permission for the reprinting of their Scholarship Examination papers. The Board are also indebted to the Delegates of Local Examinations, University of Oxford; the University of Cambridge Local Examinations and Lectures Syndicate; the Oxford and Cambridge Schools Examination Board; the Senate of the University of London; the Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield; the Delegates of the Clarendon Press, Oxford, and the Syndicate of the Cambridge University Press, for a similar service.

It may be said that the immediate cause which led to the formation of the International Commission was a divergence between mathematical and pedagogic requirements in the schools and Universities. This divergence is well illustrated by the papers which appear in the present volumes. It is hoped that their publication may contribute towards the diminution of this divergence, a task in which all who are interested in mathematical instruction are eager to co-operate.

Though the papers are published by the Board on the recommendation of the Committee, it must be clearly understood that neither the Committee nor the Board accept any responsibility for the statements and opinions contained in them.

Office of Special Inquiries and Reports,
August 1912.

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APPENDICES.

A.—RESOLUTIONS ADOPTED BY THE NATIONAL ASSOCIATION OF MANUFACTURERS OF THE UNITED STATES OF AMERICA AT ITS SEVENTEENTH ANNUAL CONVENTION, NEW YORK CITY, MAY 21, 1912.*

Whereas, one half of the children in the common schools of the United States leave school by the end of the sixth grade, with no substantial educational acquirements beyond reading, writing, and arithmetic in their simpler forms, the essentials of education and citizenship coming, if at all, after the sixth grade; and

Whereas, this half of the children soon forget much of what they learned in their brief school experience; and

Whereas, truancy and absence are so prevalent that less than three-fourths of the children are in school as much as three-fourths of the time, the enrollment being 17,000,000, and the average attendance being under 12,000,000, 1,600,000 being permanently absent from and unacquainted with school life; and

Whereas, illiteracy in the United States is 50 times that of several continental countries, and is four times greater among the children of native whites than among the native-born children of immigrants†; and

Whereas, in many schools and many cities educators are finding great cultural and educational value in the development of the motor activities, the practical and creative desires of the youth, in highly-developed practical and extended courses, in manual and prevocational training, and such courses are developing, in an unexpected degree, an appreciation of the dignity of labor of all kinds, and such moral qualities as diligence, concentration, perseverance, and respect, and causing many to successfully continue in school who otherwise would leave discouraged early in the course; and

Whereas, a majority of the children who leave school prematurely do so from no economic need, and in fact are idle about half the time between their 14th and 16th years, being the first two years out of school, and that they average for the first two years little over \$2.00 per week in earnings, leaving school principally because their interest in practical and creative effort is not provided for; and

Whereas, the loss to the schools of 50 per cent. of the children in the middle of the elementary school courses is an incalculable waste of the human resources of the Nation, these human resources being estimated by Professor Fisher as of the economic value of \$250,000,000,000, and five times the value of all our other natural resources combined.

Therefore, for these and other reasons, the National Association of Manufacturers by resolution pledges its earnest support to the following principles of educational betterment as essential to society and to the spiritual, social and physical welfare of the youth:

1. Continuation schools for that half of the children who leaving school at fourteen years of age, and mostly in the fifth and sixth grades, these continuation schools to be liberally cultural and at the same time to be extremely practical and related as directly as possible to the occupations in which the several students are engaged.

* Proceedings of the Seventeenth Annual Convention of the National Association of Manufacturers of the United States of America, held at New York, N.Y., May 20, 21 and 22, 1912, pp. 290 ff. (New York City, Secretary's Office, 30, Church Street.)

† Percentage of illiterates among the Population of 10 years and upwards, from the U.S. Census for 1910:—

Whole White population, 5 per cent.; Native-born, 3 per cent. (including (i) of Native parentage, 3.7 per cent.; (ii) of foreign or mixed parentage, 1.1 per cent.); Foreign-born, 12.7 per cent.; Negro, 30.4 per cent.

2. The development of a modern apprenticeship system wherein by contact the respective and equal rights of employer and employee are fully recognized, the entire trade is taught, and such other subjects as are essential to good citizenship.

3. The development of secondary continuation or trade schools, by which from the more efficient of the great army of boys and girls who will enter the continuation schools many may progress from these lower continuation schools, as in some other countries, to the foremost places in industry and commerce.

4. Compulsory education through adolescence, being until the 17th or 18th year, attendance being in all-day school until the 14th year, and there after in either the all-day schools or in the continuation schools for not less than one-half day per week, without loss of wage.

5. The strengthening of all truancy laws and the development of public sentiment in support thereof.

6. The training of teachers in thorough-going methods of industrial practice, including as part of such training extended experience in actual shop work.

7. The establishment of independent State and local boards of industrial education consisting of one-third each, professional educators, employers and employees, thereby insuring, as in the more successful European countries, the proper correlation of the schools and the industries.

8. The development of the vocational and creative desires of the concrete or hand-minded children now in the grades, discouraged, anxious to quit, and often called backward, only because the education now tendered them is abstract and misfit.

9. The establishment of shop schools and part-time schools whenever practicable.

10. The establishment of departments or centers of vocational guidance so that the great majority of the children who now enter industry at fourteen with no direction, 85 per cent falling into the "blind alley" occupations, may reverse the figures as abroad, and enter, under advice, intelligently and properly upon progressive occupations.

Resolved by the National Association of Manufacturers, that it is the imperative need of the industrial workers and employers of the country that thorough-going systems of industrial education be everywhere established, so that our factories may be more constantly and better employed; that standards of skill and of output may increasingly be improved, and that foreign and domestic markets may be better held and extended.

B.—PERCENTAGE OF WAGE-EARNERS UNDER 16 OF THE TOTAL NUMBER OF WAGE-EARNERS IN CERTAIN STATES.*

New England :—

- Maine, 1·7.
- New Hampshire, 1·5.
- Vermont, 0·6.
- Massachusetts, 3·5.
- Rhode Island, 4·1.
- Connecticut, 2·6.

Mid-Atlantic States :—

- New York, 0·8.
- New Jersey, 2·3.
- Pennsylvania, 3·3.

* From the Abstract of the United States Census for 1910. Boys and girls are not differentiated.

East North Central :—

Ohio, 1·2.

Indiana, 1·9.

Illinois, 1·5.

Michigan, 1·1.

Wisconsin, 2·3.

For the whole United States, 2·4.

C.—SUMMARY OF LABOUR LEGISLATION AFFECTING CHILDREN AND YOUNG PERSONS IN CERTAIN STATES.*

1. California.

(1) Prohibited Employments.

(a) to 15 years in any manufacturing or mercantile establishment, office, hotel, apartment, house, or messenger service, laundry, restaurant, place of amusement, distribution of merchandise.

(b) to 16 years in occupations injurious to health or morals, or dangerous to life and limb, and as mendicants or acrobats.

(c) to 18 years for messengers to any immoral place—saloon, gambling house, house of prostitution.

(2) Hours of Work.

(a) For all females (except in agriculture and canning) and all workers in mines, smelters, etc., 8 hours a day or 48 hours a week.

(b) To 18 years in any employment, 9 hours a day, or 54 hours a week.

2. Illinois.

(1) Prohibited Employments.

(a) under 14 in factories, stores, offices, laundries, hotels, theatres, bowling alleys, messenger service, acrobatic and mendicant occupations, and in any occupation during school hours.

(b) under 16 in certain dangerous employments, and where health may be injured or morals depraved.

(2) Hours of Work.

All under 16 must not work more than 8 hours a day, nor more than 48 hours a week, nor between 7 p.m. and 7 a.m. in any gainful occupation.

3. Massachusetts.

(1) Prohibited Employments.

(a) under 14, in or about or in connection with any factory, workshop, manufacturing, mechanical, or mercantile establishment, barber shop, boot-black stand or establishment, public stable, garage, brick or lumber yard, telephone exchange, telegraph or messenger office, or in the construction or repair of buildings, or in any contract or wage-earning industry carried on in tenement or other houses. No minor under 14 shall be employed in any occupation for wage or other compensation to whomsoever payable during the hours the public schools are in session, nor before 6.30 a.m. nor after 6 p.m.

(b) under 16, on certain specified machines, in oiling and cleaning hazardous machinery, in proximity to unguarded machinery or belts, on scaffolding, in heavy work in the building trades, in tobacco works, in any tunnel or public bowling alley, or in a pool or billiard room, etc.

* It is impossible to give complete lists of prohibited occupations. A summary of the labour laws for all States will be found in *The Child Labor Bulletin* for August, 1913, published by the National Child Labor Committee, 105, E. 22nd Street, New York City. Full details of the recent laws for Massachusetts are given in *Bulletin of the Board of Education*, 1913, No. 8, whole number 27, "Educational Legislation of 1913," State Printers, Boston, 1913. and for Wisconsin in *Bulletin of the Wisconsin State of Education*, No. 1, Laws of Wisconsin published by the Board, Madison, 1912.

(c) under 18, in or about breweries or distilleries, blast furnaces, dynamite works, oiling and cleaning moving machinery, in places of amusement where alcoholic liquors are sold, in operating motor vehicles, and in certain work connected with railroads, etc.

(d) under 21, in connection with any saloon or bar room where alcoholic liquors are sold, or in connection with any immoral place, resort or amusement.

The State Board of Labor and Industries may prohibit the employment of minors either under 16 or 18 years of age in any occupation sufficiently dangerous or injurious to health or morals as to justify their exclusion from it.

2. *Hours of Work.*—In or about or in connection with any of the establishments and occupations given in paragraph (1. (a)).

(a) For minors under 16: not more than 48 a week, nor more than 8 a day, nor on more than 6 days in the week, nor before 6.30 a.m. nor after 6 p.m.*

(b) For minors under 18, not more than 54 in a week, nor more than 10 a day, nor more than 6 days a week, nor before 5 a.m., nor after 10 p.m., nor in textile works after 6 p.m.

No person under 21 shall be employed in the delivery of messages or goods for any telegraph, telephone or messenger company, except in connection with the publication of a newspaper, before 5 a.m. or after 10 p.m.

(4) *Street Trading.*

(a) Girls under 18 and boys under 12 may not sell or exercise any trade in a street or public place.

(b) Boys between 12 and 16 must obtain a badge before engaging in any form of street trading, and must not work before 5 a.m. nor after 9 p.m., nor during hours when the schools are open unless provided with an employment certificate.

4. *New York State.*

(1) *Prohibited Employments.*

(a) under 14, in factories, mercantile establishments, laundries, hotels, restaurants, places of amusement, barbers' shops, etc., and in all employments during school hours.

(b) under 16, in mines, quarries, oiling and cleaning machinery, and operating specified machines, in use of acids, paints, red or white lead, dry colors, making and packing of matches or explosives; or malt or alcoholic liquors; in acrobatic or mendicant occupations, and for a female, any occupation requiring constant standing.

(2) *Hours of Work.*

(a) under 16. In all factories: not more than 48 a week, nor more than 6 days in the week, nor more than 8 hours a day, nor before 8 a.m., nor after 5 p.m. In any mercantile establishment, office, restaurant, hotel, apartment house, theatre or other place of amusement, bowling alley, barber shop, shoe-shining establishment or messenger service: not more than 54 hours a week, nor more than 9 hours a day, nor more than 6 days in the week, nor before 8 a.m. nor after 7 p.m.

(b) 16 to 18 in factories (and all women). Not more than 60 hours in the week, nor more than 10 a day.

(c) Girls under 21 may not work in factories before 6 a.m. nor after 9 p.m. Nor in stores before 7 a.m. nor after 10 p.m.

(d) Minors under 21 may not work in night messenger service after 10 p.m. nor before 5 a.m.

* Until June 1913, the hours of work for all under 18 were 54 a week in manufacturing and mechanical establishments and 58 a week in mercantile establishments and workshops connected with stores.

(3) *Street Trading.*

Sale of newspapers and magazines is forbidden for girls under 16 and boys under 10. Boys under 14 must obtain a badge. No sale may take place after 10 p.m. nor before 6 a.m.

5. *Ohio.*(1) *Prohibited Employments.*

(a) under 14, commonly specified gainful, and acrobatic and mendicant occupations.

(b) under 15, work in mines during school terms.

(c) under 16, dangerous occupations.

(d) under 18, messenger work between 9 p.m. and 6 a.m.

(2) *Hours of Work.*

For boys under 16 and girls under 18 in commonly specified gainful occupations, not more than 8 hours a day, nor 48 hours a week, and not before 7 a.m. nor after 6 p.m. Thirty minutes meal time is not included.

6. *Wisconsin.*(1) *Prohibited Employments.*

(a) under 14 in any gainful occupation or employment, except that during the school vacations any child between 12 and 14 years of age may be employed in any store, offices, mercantile establishment, warehouse, telegraph, telephone or messenger service, if a permit has been obtained in the same manner as an employment certificate.

(b) under 16 in many specified occupations, very similar to those prohibited in Massachusetts, or in any employment dangerous to life or limb, injurious to the health, or depraving to the morals of the child. No female under 16 shall be employed in any occupation requiring her to stand constantly. No child under 16 shall take part in any public performance in theatre, circus, etc, without a special permit.

(c) under 18 in mines, quarries, and many occupations as in Massachusetts.

(2) *Hours of Work.*

(a) under 16, not more than 8 hours a day, nor more than 48 hours a week, nor more than 6 days a week, nor before 7 a.m. nor after 6 p.m. at any gainful occupation. A lunch period of 30 minutes shall be allowed during each day.

(b) for all females, not more than 10 hours a day, nor more than 55 hours a week.

The hours of work for boys and girls under 16 years of age are limited to 8 a day or 48 a week in nine other states, viz., Arizona, Colorado, Indiana, Kansas, Minnesota, Mississippi, Missouri, Nebraska, Oklahoma, and in the District of Columbia. In Washington State, the hours are also limited to 8 a day, but there is no limit per week.

D.—LEGISLATION ON INDUSTRIAL EDUCATION PASSED IN 1913.

1. *Indiana.*—State aid is offered to local authorities which establish schools in which the instruction is of less than college grade and designed to meet the vocational needs of children of fourteen years of age who seek preparation for their work. Such schools may be day, part-time or evening. Attendance at day and part-time classes is restricted to persons over fourteen and under twenty-five years of age, and at evening classes to persons over seventeen years of age. These schools are to be under the administration of the State Board of Education, but separate from the regular school system. One representative of employers and one of employees must be upon the Board. Local authorities are to be reimbursed

to two-thirds the salary of each teacher giving instruction in vocational or technical subjects. Local advisory committees are to be appointed in connection with the schools.

2. *Pennsylvania*.—A very similar Act has been passed. Local authorities are required to establish day, part-time, and evening classes, giving training in agriculture, trades, industries and home economics. Reimbursement is made equal to two-thirds the salary of the instructors. The Act carried with it an appropriation of \$135,000 for two years.

3. *New Jersey* passed an Act extending its original legislation and creating a State system similar to that of Massachusetts and Indiana.

**E.—THE MILWAUKEE CONTINUATION SCHOOLS,
DECEMBER 1913. EXTRACTS FROM A REPORT BY
MR. R. L. COOLEY, SUPERVISOR.**

"The Milwaukee Continuation School entered upon its work on November 1st, 1912, in a small room on the eighth floor of the Manufacturers Home Building at the foot of Mason Street. There were in attendance two hundred girls under sixteen years of age from the department stores of the city. These girls were working on "permits" or work certificates* issued by the State Industrial Commission through the office of the Factory Inspector of this city.

"The school has grown rapidly from its small beginnings. The demands of both the compulsory and voluntary attendance have led to the acquisition of additional space, and a considerable enlargement of the teaching corps. There are now 1,600 permit girls and 2,000 permit boys attending school one-half day a week in the Manufacturers Home and Stroh Buildings. Thirty-one class rooms are now occupied and seventeen women and twenty-one men comprise the day teaching corps. The hours of school attendance are from 8 a.m. to 12 noon, and from 1 p.m. to 5 p.m.

"The school aims to teach the "permit" girls to cook, to prepare tasty economical dishes with a knowledge of food values and simple dietetics, to sew, to judge qualities of goods, to assist them to acquire a taste in color and design, to select suitable qualities of goods both with reference to personal dress and the furnishing, arrangement and decoration of the home, and to review and advance the pupils in the academic branches usually taught in the elementary school. There is also a definite effort made to connect each girl with the public library and to direct her reading, to the end that a taste for good books may be formed at this critical time in the girl's life, when she is breaking away from school, also, in a measure, from home and is entering upon a wage-earning career in shop or factory.

"It may be interesting to know that 900 books were drawn from the library during the month of November by these young girls, practically all of whom have not been in the habit of reading at all.

"In connection with the girl's work there has been given a brief course in the purchasing of beds and bedding, airing and making of beds, bedroom ventilation and arrangement, and the care of the sick in bed. This work has been very much appreciated by the young people, many of whom have had responsibilities thrust upon them far in advance of their years.

"Classes in typewriting and stenography are offered to young people working in offices and to those who particularly request the opportunity.

"The boys are classified broadly according to their expressed ambitions and talents. Those who clearly intend to follow commercial careers are permitted to put most stress upon the academic work in connection with typewriting, stenography, book-keeping, business practice, &c.

"Those who manifest a special ability, as for instance, talent for and appreciation of color and design, coupled with ability in free-hand drawing, have occupations called to their attention in which such ability would be a distinct asset. Such pupils we aim to segregate and afford the kind of special training they need.

* See page 146 (Wisconsin).

"The great majority of the 2,000 boys who attend our continuation school are not working at jobs which will afford them a living as men, or which, in the main, lead to work that will ever afford a man's pay.

"Some of the boys have ill-formed ambitions to become one or another kind of a journeyman, at some remote time. On the other hand, many have no idea of what is before them, are not thinking ahead, and have no conception of the various trades or occupations available in this community which might afford them a way up. They shift without thought or reason from one job to another and frequently their latter condition is worse than the former.

"To such boys we aim to give a diversified shop experience which includes wood-working, metal working and simple work with electrical appliances. One and one-half hours each week are spent by small groups in the shops under competent instructors. In addition, these same young people spend one and one-half hours each week in the mechanical drawing, and one hour in the academic work. All classes are kept small.

"The mechanical drawing continues for thirty-two weeks in each school year and is calculated to enable the boys to read blue prints and to become as proficient in mechanical drawing as the time and ability of the boys will permit. This training it is expected will be of use in any of the various mechanical lines which the boys may ultimately follow.

"The work with both boys and girls is further intended to guide them in their selection of vocations, to preserve by means of reviews what academic knowledge they may possess upon leaving the elementary school, and to advance them in those branches, to assist and advise them in securing work, to give them greater ability to do things with their hands, and to train them in the duties and obligations of good citizenship. This work is obviously very important during the lean years while these young people are confined to jobs which inherently have little or no educative influence, and, in many instances, may be said to be "de-educative," if one may be permitted to coin the word.

"From fourteen to sixteen years is a period of retrogression for the great majority of boys and girls who go out to work. This is specially true of those who have not finished the elementary school. Instances may be cited to the contrary, but it is only by viewing the young people in large numbers that the rule may be ascertained.

"It has been demonstrated that in the brief half-day a week at the continuation school much of the work done in the elementary school can be clinched and made a permanent possession of the boy or girl. Likewise in this time a valuable practical training can be given which will be found immediately useful.

"The function of the continuation school, however, is much broader in scope than merely to provide for the "permit" pupils, of whom there are approximately 5,000 in the city. The task of growing to meet the needs of this particular feature of the work has been a large one and has led to the work of the past year being somewhat limited to that phase.

"Day classes for apprentices have been established at which 200 are in attendance. Voluntary day classes have been conducted, as in the case of the druggists clerks, who attend twice each week. Other voluntary day classes are being formed as rapidly as the need and desire for the same is ascertained.

"The work conducted under the Local Board of Industrial Education is scarcely more than a year from its inception. Preparing part-time school facilities for thousands of "permit" boys and girls has largely absorbed the attention of the authorities. This work, however, as stated before, does not measure the scope of the work intended to be carried on under the provisions of the law. It is the duty of the Local Board of Industrial Education to analyze the educational needs and desires of the employed men and women of the community and to afford reasonable opportunity for their gratification."

F.—SOME RECENT AMERICAN REPORTS DEALING WITH THE RELATION OF THE SCHOOLS TO EMPLOYMENT.***UNITED STATES BUREAU OF EDUCATION.**

Manual, Industrial, and Technical Education in the United States
By Calvin M. Woodward. (Chapter in the Report of the Commissioner of Education for 1903, Vol. 1.)

Washington: Government Printing Office, 1905.

Recent Reports of the Commissioner of Education.

Washington: Government Printing Office.

Bulletins.

Washington: Government Printing Office.

1907. No. 1. Whole No. 367. **The Continuation School in the United States.** By Arthur J. Jones.

1908. No. 6. Whole No. 389. **The Apprenticeship System in its Relation to Industrial Education.** By Carroll D. Wright.

1913. No. 17. Whole No. 525. **A Trade School for Girls. A Preliminary Investigation in a Typical Manufacturing City—Worcester, Mass.** By the Research Department of the Women's Educational and Industrial Union of Boston.

1913. No. 19. Whole No. 529. **German Industrial Education and its lessons for the United States.** By Holmes Beckwith.

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* Can be seen at the Library of the Board of Education, Whitehall, London, S.W.

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PAMPHLETS GIVING INFORMATION ABOUT THE SCHOOLS OF GARY, IND.**Notes to Visitors.**

Can the Administration Department of a School System serve as a laboratory for the Vocational Training of Children? By G. E. Wulfing, Director of Industrial Education, Gary, Ind. (Published in the *Journal of Proceedings and Addresses of the Fiftieth Annual Meeting of the National Education Association of the United States*, held at Chicago, July, 1912. Offices of the Association, Ann Arbor, Mich. 1912.)

Utilization of the School Plant. By William Wirt, Superintendent of Schools, Gary, Ind. (Published in the *Journal of Proceedings and Addresses of the Fiftieth Annual Meeting of the National Education Association of the United States*, held at Chicago, July, 1912.)

Gary Public Schools. By William Wirt.

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APPENDIX I.

THE SCHOOL SYSTEM OF GARY, INDIANA.

A.—REPORT BY DR. R. H. CROWLEY, SENIOR ASSISTANT MEDICAL OFFICER TO THE BOARD OF EDUCATION.*

I was recommended to visit the schools at Gary in order to see in particular the provision made for physical education, the playground system and the educational developments along manual lines. The Superintendent of Schools, Mr. Wirt, very kindly gave up the whole day to me, and I had accordingly a particularly favourable opportunity for learning first hand as much of the working of the school system he has planned and controls as was possible in the short time available.

Gary has sprung into existence during the last six years owing to the operations of the Steel Trust. This corporation bought some ten miles of land bordering Lake Michigan and has erected a long line of steel mills, which completely cut off the town behind from access to the lake and which emit a vast amount of dirt and smoke. Six years ago it is said that the site of the town was a dreary waste of sand dunes and scrub; there is now a population of over 30,000. Mr. Wirt was appointed Superintendent of the school system about five years ago. He was then in charge of the public schools of Bluffton, Indiana, but saw more scope for developing his ideas in a new town such as Gary.

There is in the Gary school system nothing revolutionary, nor has it been dictated by any theory of education. "We do not wish," says Mr. Wirt, "to take any chances with undigested educational philosophy." The system is based simply on the recognised needs of the child. As to what these needs are, Mr. Wirt claims educationists are agreed—

"That the twentieth century school must educate for citizenship and character, must develop individuality and efficiency, must develop the power of reflective thinking, form habits of application, and somehow get the child to find pleasure and joy in constructive effort. We are also agreed, I think, that such an education is possible only by giving the child the freedom of self-activity. We are also agreed that the civic care of the child in the twentieth century must include satisfactory public facilities for amusement, play, and work, as well as study."

In developing the argument for the Gary system Mr. Wirt emphasizes the need for reproducing in the school the opportunities for education which the child used to have in the home, formerly in large degree an industrial centre. In the country

* Dr. Crowley attended the Fourth International Congress on School Hygiene held at Buffalo, August, 1913, as delegate of the Board of Education, and afterwards took the opportunity of visiting certain cities and institutions in the States in order to learn of the progress of the School Medical Service. Incidentally he spent a day at Gary.

or village home the child learnt by actual contact with life, and its education; however limited in other respects, was never divorced from reality.

“To have learnt to *know* the right thing to do is not character, but to have *formed the habit* of doing the right thing is character. When the home lost the opportunity for the industrial training of its children, it lost its power for efficient morals and general character training, because these were inseparably linked with the industrial training.”

The schools and the school curriculum at Gary are planned with a view to providing this training for life. In the case of the newer schools, each school is complete in itself, providing for children from infancy up to college life. In the evening the school building is used by adults. All the work usually associated with a kindergarten, elementary school, secondary school, trade school, evening continuation class, is carried on as a continuous whole. Three-fourths of the boys remain at the school for whole or part-time up to the age of 18. In this way caste tends to be eliminated and the school becomes a powerful agent in the development of democratic ideals.

The Emerson School.—This school, the working of which I saw in as much detail as time would permit, accommodates over 2,000 pupils. It is built in one block and does not give the impression of a school with an accommodation approaching this number. It stands upon five acres of ground, shortly to be increased to ten. The playground is considered an indispensable part of the “school plant.” The newest school in Gary has a playground of 20 acres and I was informed that no school in future is to be built with less.

The school is built on an E-shaped plan, the class-rooms opening on to wide corridors for the most part well lit and ventilated. There are no class-rooms strictly speaking comparable to those usually obtaining in an ordinary school, *i.e.*, no one room belongs to any one class. Only a limited number of rooms, moreover, are fitted with ordinary desks and seats, each room being equipped for the purpose for which it is intended to serve. Further the whole school plant is in constant use, whether it be the workshops, gymnasium, playground, swimming bath, auditorium or class-room, and accordingly the number of pupils the school can accommodate is not based upon the regular class-room accommodation, but upon the total accommodation provided.

The class-rooms proper are furnished with adjustable desks and seats. The top of the desk is removable, one side being used for drawing, for example, the other for such work as clay modelling. It can be placed at varying distances from the child and the slope adjusted as required. No locker is provided as part of the desk, each child having a locker in the corridor. Other rooms are fitted with tables of different sizes and chairs, or with chairs only, either movable or fixed according to the purpose to which the room is put. There are all sorts of

rooms for special purposes—for botany, zoology, physics, chemistry; crafts rooms for electrical, metal and plumbing and forge work, moulding, joinery, upholstery, printing; kitchen, laundry, sewing room, music and book-keeping rooms, library, and stores of all kinds.

Educational use of School Building.—Much emphasis is laid upon the use of the *school plant as a laboratory*. In Mr. Wirt's words:—

“Every part of the school plant can be made an educational opportunity. There is no reason why the school furniture and much of the equipment cannot be made in school cabinet shops under the direction of a cabinet maker selected for his teaching ability as well as his mechanical skill. There is no reason why the school painting, stage scenery, plumbing, electrical work, carpentry, printing and book binding, forging, foundry and machine work cannot be done in the same way. There is no reason why the school engineer should not be selected because of his teaching ability as well as his mechanical skill. The boys can work with this engineer as apprentices during certain hours in the day, and learn to fire boilers, operate pumps, engines, generators, motors, heating and ventilating machinery. There is no reason why some of the nature study teachers should not be selected because of their practical knowledge and skill as well as for their college degrees. A practical landscape gardener can take complete charge of the school garden, lawns, shrubbery, and trees, and the children will be delighted to assist him. Even the stairways and school corridors provide the highest possible educational opportunity if we will but use them.”

The purchase, care, and distribution of supplies for the school is used as a laboratory for arithmetic, English, and instruction in clerical work. In the general store and book-keeping rooms all is conducted by the pupils. Strict business accuracy is demanded in order that the precise cost of each department may be determined. All school materials are supplied through the store and charged to the corresponding account. An expert accountant trains the pupils in work of this kind.

The coal consumed in the boilers, the materials used for building and repairs, the milk and other articles of food used in the school café are all tested by the pupils. The school lawn, shrubberies, and gardens form a laboratory for nature study. The sanitation of the school and the care of the building afford many opportunities for training.

The man in charge of the heating and ventilation apparatus is a skilled man and acts as a teacher. “Everyone employed on the school premises should be capable, clean enough, and of sufficient intelligence to be a teacher in his or her own line of work.”

Vocational Training.—The industrial work, however, offers the chief opportunity for using the school plant as a laboratory whether for manual or purely industrial training. In the *electrical* shop every advantage is taken of the use in the school of electricity for lighting, heating, and power purposes. Theory and practice are intimately associated. Construction is

taught, apparatus is tested. In the *forge* iron plates were being rivetted, about half-a-dozen boys, aged 12-15, working under a practical blacksmith; castings were being made for jumping poles used in the playground, for a pump, and for the school desks and seats. In the *sheet-metal* shop metal boxes were being made for use in the pupils' lockers and in the various other shops in the school. There is a complete plant for the teaching of *steam production*, some boys being associated with the more theoretical, others with the more practical, part. Calculations are made as to the results obtained from the fuel used, whether for the generation of steam or electricity. Sundry school printing—the school magazine, forms, circulars, &c.—was being done in the *printing* shop. The English class correct the proofs. In the *woodwork* shop various articles of school furniture were in process of construction, and of particular interest was a simplified adjustable school seat. All the fitting and furnishing of the school has been carried out by the pupils. Lack of time may necessitate assistance from outside, and help may be required too for some of the heavier and more laborious forms of manual work. There seems, however, but little limit to what the pupils undertake. All tables, desks, chairs, and cupboards are made by them. Repairs to boilers and engines are carried out by the boys, who mould and cast, for example, new boiler plates as required. If any work of this kind cannot be done for one reason or another at the school the necessary measurements and drawings are made and the work executed at the foundry direct from the pupils' drawings. Recently a wing has been added to the school, the designing of and drawings for which were done by the pupils as well as some of the internal construction.

At Gary a wide interpretation is placed upon the term "vocational" as applied to education. In that the school lends itself to a complete training it includes of necessity opportunities for trade training. To be eligible for this pupils must be in the seventh grade or above or if below the seventh grade be 14 years of age or older. The following extract will show the points considered important in determining what line of work a pupil should take up:—

"The pupil and his wishes are the first consideration. His parent's consent to the work desired must be had. It is necessary to limit the number of students in each class. The teacher's judgment as to the wisdom of the pupil's choice must have some weight. The pupil's previous work in any shop must be considered, the pupil having entered upon a definite course being given every chance possible to complete it.

"In all vocational lines of work offered there is provided a short probation course. This course is for the purpose of assisting the pupil in selecting the line of work he wishes to pursue. It is just as important for a boy or girl to find suitable life work as it is to have training after his selection is made."

Opposition on the part of organised labour to vocational education in the narrower sense of the word does not exist to any appreciable extent in Gary. Probably this is due in part to the fact that this form of education is an intimate and

organic part of the whole school system. The community centres in the school, the playground, gymnasium, swimming bath, and the school itself being used as well by the adult as by the child. The community looks to the school as the natural place for all education, training and recreation. And further all the trade instructors are members of their respective unions.

The following extract is of interest as showing Mr. Wirt's conception of the relationship which should exist between the elementary, secondary, and trade schools:—

"The subjects taught in our Emerson School are practically the same as those of the first-class manual training schools. Usually the manual training school is the high school or secondary school, where only those students who have completed the work of the common schools are admitted. Our reasons for changing this practice are the following:—

- "(1) The educational value of hand work, along with mental training, is as great in the elementary schools as it is in the secondary schools.
- "(2) The efforts of most cities to avail themselves of the educational advantages of hand work, through elementary manual training in the graded school rooms and manual training centres, has in many cases been disappointing, and is always much less efficient than the educational hand work possible in a properly constructed elementary manual training school.
- "(3) Only a small percentage of students go to the secondary school. The remainder must therefore be reached, if at all, in the elementary school.
- "(4) By having elementary manual training schools for the common school work we are able to do two years and possibly three years of the customary high school course in these elementary schools. In our opinion this plan offers the following advantages:—

"(a) Many students do not go to high school because they are timid. The parents believe that in high school the children must dress well, buy expensive books, belong to societies and live on a social plane which they cannot afford, as well as pay street car fares, buy lunches, and many other extra incidental expenses. We have personally demonstrated in three different school systems that many more students go to high school from the elementary school when the high school and elementary school are together in the same building. The children and parents are accustomed to the school, and do not think any more of going from the eighth grade to the ninth grade than they do of going from the seventh to the eighth.

"(b) The ordinary first two years of the high school usually has two-thirds of entire high school enrolment. The work of these two years is very elementary, and can be done just as successfully in the elementary schools. Now, the high school building, equipment, and faculty are much more expensive *per capita* than the elementary schools. Yet two-thirds of its capacity is usually given over to work that can, in fact, be done better in the elementary school at much less cost.

"(c) Our experience in manual training during the past 12 years has convinced us that the school work up to the approximate age of 16 years should be general in character. Manual training up to that age should be largely for a general educational training, and not so much for its definite vocational value. Most boys beginning at the approximate age of 16, however, are anxious to get at something definite, something that will count directly for a special vocation, to make a living, and get on in the world. We believe, therefore,

that the age of 14 is not the right period for a transfer from the elementary to the secondary schools. The secondary schools can hardly be adapted to the needs of students from 14 to 16 and 16 to 18. We wish to turn over to the elementary school all of the general indefinite period of instruction up to the age of 16 years approximately. Then we wish to adapt the secondary school to definite vocational training for students 16 to 20 years of age. By eliminating the first two years, 14 to 16, we can add two years, 18 to 20, without much increase in cost. Our secondary school will, in fact, be a technical college or polytechnic school, and will give the opportunity to every young man and woman in Gary to secure a practical training for life's work in any commercial, professional, or industrial line. The school will also offer courses identical with those of the traditional Liberal Arts College. It is also the intention to arrange for most of the commercial, professional, and trade courses to be taught in continuation schools and night schools. We wish to make it possible for young men and women to earn their own living at some occupation and at the same time continue their education for what they deem to be their proper life work. As far as possible, of course, we expect such a school to be a great advantage to persons who are serving an apprenticeship in their chosen field of work, who will be able much more thoroughly to master and make the most of their talent by being able to join with the practical experience in the shop or business house the scientific training of the school.

"The traditional school attempts to fit a boy for a practical everyday industrial life, by taking him out of and isolating him from the practical industrial life of the world. Then when the boy has lived several years in this separate and distinct school world the school suddenly cuts him off absolutely, and the boy is left to adjust himself as best he can to the unknown world of practical industry and business. This mistake we wish to avoid in the schools at Gary by keeping the schools as close to the industrial and business life of the people as possible, and by going with the boy into his life's work. Every successful man is a student throughout his whole life. What he learns in school is insignificant compared with what he learns out of school. With our continuation schools we hope to get many young men to form the habit of being students of their work. The continuation school will not exist so much for what it teaches and does directly for the boy, for it will justify its existence by what it gets the boy in the habit of doing himself independent of the school."

The School Curriculum.—The school curriculum is so arranged that the whole of the school plant, including the gymnasium, baths, and playground, is in operation all day. Accordingly, approximately one-half of the number only of ordinary class-rooms is required. Two hours daily are given to formal instruction in desks. English and mathematics are taught incidentally as well as formally, and special measures are taken to ensure that this is in fact done. Great elasticity is observed in the size of the classes. Thus the moulder has six pupils only at one time; in the auditorium there may be 400. For formal class work the maximum is 40 children. The playground, like the rest of the plant, is in constant use, a batch

of about 40 children being always out of doors in charge of one of the physical training teachers. Speaking generally, the teachers are specialists in their subjects, *e.g.*, botany, zoology, geography, &c. There are no "class teachers" having the sole charge of a class except in the kindergarten. There are consequently no "superintendents" to see that the ordinary teachers teach the special subjects properly. There are, however, supervisors of the teaching of English and mathematics respectively. This is necessary, since the instructors in special subjects may not be sufficiently competent to teach these other subjects in an adequate or uniform manner, and the school aims at a high academical standard. There is a supervisor of industrial education generally, but his functions are administrative. The theoretical and practical teaching of a subject are not always entrusted to the same teacher. There is, for example, a teacher of the theory of cookery and of food values and also a practical cook.

The system admits of much *flexibility*. A child who is particularly backward in one subject can by joining one or another class devote more time to this subject. An older child, according to his or her bent, can, as may seem suitable, devote more or less time as the case may be to manual work or one or another of the special subjects. A delicate child may spend more time in the playground, may rest out there if necessary or engage in light forms of manual work.

An interesting feature of the school is the presence of small boys of 8-10 years of age in the various shops and laboratories. They spend their time observing and picking up what they can, but receive no kind of instruction. This association of younger and older children Mr. Wirt thinks very helpful. The younger ones look forward to doing the work of the older pupils, and when their turn comes for entering one or another of the shops they are familiar with the kind of work which goes on in each and are able to exercise some choice as to the form of manual training they would like.

Physical Training.—There are four teachers of physical training, two men and two women who work under the general direction of the two medical officers, a man and a woman respectively. These four teachers have control of the playground, gymnasium, and swimming bath, and are responsible for the training in hygiene generally. The playground is in constant use all day, before, during and after school hours. The school is not turned out for "recreation," but the playground is occupied for an hour at a time by successive classes of about 40 children. Facilities are provided for a great variety of games, *e.g.*, baseball, football, tennis, basket ball, hand ball, &c. The outdoor gymnasium includes a variety of apparatus, and the small children have sand pits, a wading pool, &c. Part of the ground is reserved as a school garden, trees are

planted wherever possible, and several animal houses have been constructed by the pupils. The swimming bath, 40 ft. by 18 ft. with a shower bath installation adjoining, is used by both boys and girls. The former bathe twice a week and in the summer more often. The water is purified by filtration every day. Two gymnasias are provided, one for each sex; 30 minutes are given daily to physical exercises.

About 150 to 200 of the children take their midday meal at the school. After our tour of the school in the morning Mr. Wirt took me to the school café where some half dozen girls behind a long table were selling dishes in great variety, all of which had been prepared by themselves and other girls in the school kitchen. In the café adjoining, set out with small tables, teachers and scholars were taking the midday meal.

Medical Supervision. — Two medical officers, a man and a woman employed for whole time, supervise the Gary schools and children. A couple of rooms are set aside for their use and also a bacteriological laboratory. In the work attached to the latter assistance is given by one or another of the pupils. Examination is made of all children on admission to school and shortly before leaving and all children will now be examined annually. The man doctor visits the school each day for half a day, the woman doctor three afternoons each week. They treat trivial ailments, supervise the physical training, remedial exercises, the swimming pool and the school buildings generally. No nurse or dentist is at present employed, but such officers are likely to be appointed in connection with the new Froebel School.

School Attendance. — The school attendance problem is considerably simplified in Gary. As already pointed out there are no regular class teachers in the schools, but arrangements are made for each teacher to keep in close touch with one group of children. To this end each teacher meets all the children coming from one "block" for the first 15 minutes of each day. The children are of course drawn from all the grades. A plan of each "block" has been drawn by each group respectively showing the accommodation, &c., for each family occupying the block, and in this way an intensive social study of each block is rendered possible. If a child is absent the cause is probably known to one of the other children, or they can quickly find out. Should there be a case of infectious disease the medical officer is at once informed and necessary action taken. Mr. Wirt considers that this system gives an important human and social touch to the work of each teacher. But little scope is left for the attendance officer, his energies being almost entirely devoted to seeing that newcomers are placed on the books of the school and to dealing with genuine truants. Much useful social work is made possible by this system. Should it be clear, for example, that a family is unsatisfactorily housed

information can be obtained of satisfactory quarters in some other block. A teacher keeps the same block year after year. I was informed that a high average of attendance is obtained.

One might suppose that a school system such as that outlined would be costly. This does not appear, however, to be the case. By using the whole of the school plant continuously the accommodation of the school is greatly increased. The cost per head of the Emerson School for 2,000 pupils was approximately \$100. Mr. Wirt informed me that an ordinary elementary school at Chicago cost \$200 per head to build. The cost of maintenance of the Emerson School works out at considerably less than that of an ordinary school. Mr. Wirt shows that the annual cost of maintenance of the Jefferson School at Gary, the first built, and of the ordinary type, is much greater than that of the Emerson School. The cost per head of teachers and equipment, he states, is materially less. In the case of the Emerson type of school the craftsmen are no charge upon the funds. They are retained only on the understanding that the work done in their respective department pays their salary and covers the cost of material used. This obtains without difficulty in the case of all the trades.

The cost of land is high. No less than \$5,000 per acre has been paid for the five acres of ground upon which the Emerson School is built. For the new school with 20 acres of land attached \$4,000 per acre is being paid.

In considering the economy of the system it should be remembered that the whole school plant is available for the use of adults in the evening. In this connection Mr. Wirt writes:—

“ We also desire that each of these buildings be a social center for the respective school districts. The manual training, technical, commercial and industrial courses, and physical culture classes, will be especially emphasized in the night school. The gymnasias, swimming pool, shower baths, playground, auditorium, lecture rooms, outdoor gymnasium, branch station of the public library and industrial rooms, &c., are intended for the adult population, as much as for the school children. The Emerson School building includes everything belonging to the recreation buildings of the playground parks of Chicago. Even though these are controlled by the school corporation, yet the general public will have just as free use of the plant as they have in Chicago where the park boards are in control. In our opinion small towns cannot support playground centers of the Chicago type unless they are associated with the public schools.”

And again:—

“ The opinion is becoming fixed that we have not utilised the school plants completely unless they are used for recreation and social centers by adults. Fortunately a school plant that provides for the constructive play and recreation activities of children is also most admirably adapted for similar activities with adults. The playgrounds, gymnasiums, swimming pools, auditorium, club and social rooms, library, shops, laboratories, &c., make a complete social and recreation center for adults. Experience has demonstrated that the facilities for academic instruction add to the attractiveness of the plant as a social and recreation center.”

It is the desire of Mr. Wirt to have the schools in full swing all the year round, a given child attending any three of the quarters out of the four. At present this is not practicable. The school plant, however, is never closed down completely. Much of it is available for use during the summer vacation, as also all day Saturday. On Sunday the library, gymnasium, swimming bath, and playground are available.

Most of the "street and alley time" is spent on the school premises at Gary. Towards securing this the playgrounds are available and the playground teachers in charge an hour before school, at midday and for an hour or two after school. The older pupils too use the gymnasium and swimming bath out of the regular school hours.

B.—REPORT BY MISS HILDA WILSON, LATE LECTURER AT THE
MOORFIELDS TRAINING COLLEGE.

The town of Gary, Indiana, has become famous in America for its success in providing an education for its children that is exceptional in its economy, popularity, and usefulness. The town is of exceptional type, as it is completely industrial. It is, in fact, a town made to order by the Steel Trust, to accommodate the thousands of their employees in the great steel rail factory that stretches between the present town of Gary and Lake Michigan. The town grew in population as fast as it could be built, and in five years time 25,000 people were living in brick blocks on paved streets that had been mere sand dunes.

Such a development, especially as the laws of the State were not in any way adapted to it, put great difficulties in the way of the school authorities for the town, and from these very difficulties they evolved exceptional virtues. The schools of Gary had to be a great popular and administrative success, or they would have ruined the infant town.

The economy of the system was made advisable by the following facts. The school funds come from two sources, as in England: from the town taxes, like our rates, and from the State School Fund, like our taxes. The schools began in 1907; by the law, the income from the first source must be obtained from an assessment of property made two years before. Property was assessed in March, 1907 and the tax levy made in August, but this levy was to cover the cost of maintaining the schools in the year 1908-9. During this year the town attained nine times and more than nine times its size in March, 1907. This disadvantage remains, for there is no reason at present why the growth of the town should not continue rapidly. As for the second source of income, that is apportioned on the basis of the number of school children in the town in the April of any year, for the period beginning the September of that same year. In Gary there is always a large increase in the population during the late spring and summer months, because those are the

building months of the year, and also the months when immigrants, who are needed in large numbers by the Steel Works, arrive from Europe. Thus the town has only received about half its equitable share from the State Fund.

This inadequate income has had unusual demands upon it from the first. There was nothing with which to start. All funds for the first year had to be borrowed, and everything needed, from the school site to the maps, had to be purchased at once. In most towns the school plant is gradually secured and increased, and school sites can be procured at reasonable rates some years before it is necessary to build upon them. This could not be done in Gary, where the cost of land for school sites was from the first 12 to 20 per cent. of the cost of the buildings, even though such sites were far smaller than they should have been. The Superintendent strongly urged from the first that sites should be reserved in the territory that would be eventually built over, sites not merely for immediate school requirements, but for all time. These sites should also be sufficient for public playgrounds, preferably near the schools, so that the school lavatory and bath facilities should be available.

The limited resources of the School Town and the overwhelming obligations to be met led to a most careful investigation and study of economy in the provision and upkeep of the school plant. The result of this investigation was the decision to provide a school, and eventually several schools, of a type altogether superior to that of the ordinary Common School of American towns. As a town grows, it is usual in America and Canada to add year by year to the number of these Common Schools, and then, as demand arises for the secondary education, which is also provided free, to form advanced classes in one or more of them until the city is large and prosperous enough to build a separate High School. This demand would have arisen late in the life of Gary, for the population has so large a proportion of foreigners that the demand for secondary education, which generally comes from the American born, would have been poorly supported.

There is in Gary one Common School of a usual American type, accommodating 360 children, and having a small playground. I understand that this school was not built by the School Board, but by the Gary Land Company when they were first laying out and improving the estate; and that they let it at a fixed rent to the School Board. The economy of building schools of a superior type is best shown by comparing their cost with that of this small school.

The Common School, which is called the Jefferson School, had an original cost for site, building, and equipment of 50*l.* per pupil. The superior school already built and equipped, and called the Emerson School, can accommodate at least 1,800 pupils, and cost 25*l.* per head. The saving to the town on the

original cost of the eight or so large schools that will eventually be required, as compared with the first cost of the 40 small schools that would be built otherwise, is thus at least 50 per cent.

It is the annual cost of maintenance, however, including the interest on the building debt, that is of chief importance to the taxpayer. This in the two schools is actually as follows (the amounts are in full, not per head):—

	Jefferson School.	Emerson School.
	£	£
Light, water, heat and ventilation -	360	700
Janitor service - - - - -	300	800
Principal - - - - -	240	400
4 per cent. on building debt -	720	1,800
Insurance, depreciation and repairs -	500	400
	£2,120	£4,020
	5	
	£10,600	

Annual cost for 1,800 children in Jefferson School would therefore be 10,600*l.* as against 4,020*l.* for the same number in the Emerson School, a clear saving to the taxpayers of 6,580*l.* per annum.

In explanation of these figures it should be stated that the cost of assistant teachers is reckoned to be the same in either case, on a basis of 40 pupils to a teacher. The Emerson School employs a number of specialists, as would an ordinary High School, but the extra cost of these teachers is counterbalanced in ways that will be explained below. The first item, heat, &c., is more economically provided in a large building than in a smaller one. The janitor service includes that of engineer, caretakers, cleaning, &c. The salaries of principals in both schools may seem small to Englishmen, but it is not the custom in America to make a very great distinction between the salaries of the headmaster and those of his chief assistants. The Superintendent of Schools does a good deal of the work, and undertakes much of the responsibility that would be laid upon the headmaster in England. Lastly, the fact that "insurance, depreciation and repairs" would actually cost less in the more costly building is due to the superior workmanship and material and fireproof nature of the Emerson School. It is a practical demonstration of the economy of superior construction.

"The construction is fireproof except the roof. All walls are built of vitrified brick laid in cement mortar. Ground floor halls, manual training rooms, all locker and toilet and wash rooms, gymnasias, and swimming pool have white enamelled brick wainscoting seven feet high. All halls have

marble baseboard. All stairs have marble risers, stringers and newel posts. All closet stalls in toilet rooms have marble partitions, and high-grade plumbing and electrical fixtures are used throughout. The blackboards are natural slate. The interior finish is quarter sawed oak. All window stools are brick. A program master clock controls secondary clocks and the program bells in all class-rooms, hall and playground gongs. Telephone system is installed to necessary points in the building, and in the basement from Principal's office. Floors are marble, granitoid or clear maple. The most approved heating and ventilating apparatus is used, with automatic temperature and ventilation control. All air for heating and ventilating is washed before it is delivered to school rooms, which lowers the temperature about ten degrees during hot weather and brings up the humidity of the parched dry air in cold weather. This washer also removes all dust and soot, which in a short time would otherwise ruin the school room walls and ceilings, which will be oil painted.*

With all this, the Emerson School works out at a less building cost per cubic foot than the other building, 5.15 pence against 5.835 pence per cubic foot. The reason for this will be stated later in the description of the school.

The School Board expect to be able to reduce the tax levy for the town considerably by building schools only of the Emerson type in future. The tax required for their upkeep would amount to .6*d.* in the pound on real estate values. For schools of the other type the tax would be nearly 2*d.* in the pound. In one year after the opening of the Emerson School the tax was more than .7*d.* in the pound less than the preceding year.

The construction and curriculum of the Emerson School are therefore contributory to genuine economy. They try not only to decrease the school expenditure in Gary, but also to get more for their money. They do this by providing a fourfold equipment instead of a single one, and then by seeing that this equipment is all put to its proper use for as many hours as possible in the day and for as many days as possible in the year.

First, there are the ordinary class-rooms and libraries where the child studies from books and has its lessons from the teachers of the academic subjects. Secondly, there are playgrounds, gymnasias, and swimming pools, where the child can play and secure a general physical training. Thirdly, there are gardens, studios, laboratories and shops, "where the child can work and learn to do efficiently many things by doing them." Lastly, there is a large hall, where by lectures, recitals, dramatic performances, phonograph, player piano, stereopticon lantern and moving pictures, the visual and auditory education of the child may be efficiently carried on. "Four separate and distinct places are provided for each child," but the cost per child is not increased, it is actually diminished. It cost less to build and equip the swimming pool, the gymnasium auditorium, manual training rooms, and to equip the playground with material for all sorts of games, than it would have done to provide the ordinary class-rooms and libraries four times over. The economy is due

* First Annual Report of the Gary Public Schools, 1908.

to the fact that these less expensive parts of the school equipment are kept working all the time. The child spends about a fourth of his time in the expensive class-room, and the other three-fourths is divided between the less expensive rooms and physical education. The usual American plan of giving each child a school desk for his exclusive use, which is filled with his books and equipment, has been abandoned. Each child has a steel locker for his wraps and school material. These lockers, though they have a special compartment for books and keep all possessions perfectly safe, cost much less than the fitted cloak-rooms usually provided.

On this basis of full use of the building the Emerson School will actually accommodate 2,240 children, and it is only for the sake of comfort and rather small classes (less than 40 per teacher) that the figure 1,800 was taken as the basis of calculations. In addition the school can easily accommodate 1,500 evening students without at all interfering with the work of the regular day school. In fact, adults use the school building as freely as children. A branch of the Gary Public Library occupies two rooms on the ground floor, so placed that it can be entered directly from the outside without climbing steps. The school provides for the adult population what the neighbouring city of Chicago has been at great cost to provide and maintain separately—social and recreation centres. The playgrounds, gymnasium, swimming pools, auditorium, club and social rooms, library, shops and laboratories make ideal surroundings, and the fact that attendances registered at the gymnasia, for instance, are about three million a year, and more than those registered in Chicago, proves their popularity.

The popularity of the school system is its next important feature. It is shown by the attendance. As the Superintendent says, after the school has had two or three years' trial, "the children want to go to such a school every day in the year and eight to ten hours each day."

This popularity seems to be due to the variety of the work offered, its exceptionally attractive presentation, the freedom allowed to the children, and the motive supplied for their work. These reasons are in order of increasing importance. First, the variety. All the subjects usually taught in the public schools are included in the curriculum, three languages, four sciences, commercial subjects, music and art throughout, and all things taught in the first-class manual training schools. Domestic science and art are of course included for girls, though there is no intention to keep the boys out of the kitchen or the girls out of the woodwork rooms if they wish to exchange activities. As the school is not a trade school, but a vocational one in the sense of helping children to choose their vocation, the pupils are encouraged to try their hands at many kinds of work, and great

proficiency in any one task is not expected. Many of the best trade teachers in the States desire this very training in all-round manual work to be carried up to the age of 16 or more, before a special trade is chosen and learnt. The Gary authorities hope eventually to have a Trade School to take pupils from 16 upwards, but there will be no need of the ordinary High School, either with a special vocational bent or otherwise. Add to this the exceptional facilities for physical training, dramatic and other displays, and for play, organised or free, and it would seem that some, if not many, sides of the school life must attract every child.

The attractive presentation of the work is due to two factors, special teachers and special equipment. With the exception of the arithmetic, history, political geography, and English (exclusive of literature), all subjects are taught by trained specialists. Each of the elementary school classes has a class teacher, who is responsible for the four subjects named above, but who may, and generally does, interchange with the teacher of the next class for certain subjects. The most usual division is for one teacher to take the reading, writing, spelling, and formal language in two classes, while the other teacher takes their history, political geography, and arithmetic.

In America, specialist teachers of manual training, music, drawing, &c., expect and receive higher salaries than all-round teachers. The cost in the Gary schools is reduced by the elimination of supervisors. Americans do not expect one teacher to be able to teach all the academic subjects satisfactorily, and manual work, sewing, physical culture, music and art as well. But they compromise as a rule by letting the teacher train in all these subjects, and then setting supervisors over her in each of the more technical subjects until she wearies of their supervision. The teacher in an American elementary school may, after her training, have to pick up the methods of six to a dozen special supervisors, men and women, who spend their time going round and teaching her their pet devices for manual training, reading, writing, music, drawing, nature study, and physical culture. It occurred to the Gary Superintendent that while these supervisors could not make specialists out of the ordinary teacher, they would not be needed if specialists were employed. So the specialists are an economy from several points of view. It seems a mere truism to say that they do their work better; that alone is a great saving of the children's time and energy. They enjoy their work, and the children enjoy it in consequence. Perhaps the falling off of the supply of elementary teachers in England may be partly due to the fact that those who would, ten years ago, have become pupil-teachers and then trained have now a chance of some years in a secondary school. There, in the hands of specialists, they begin to take a real interest in certain of their studies; and the idea of teaching every subject

required by a class of children becomes exceedingly distasteful to them. In Gary the surroundings also of the specialist teachers are carefully prepared for their work. The manual training rooms, laboratories and gymnasia have been mentioned, but there is also a nature-study room for that special instructor, two music rooms, two drawing rooms and a literature room. The work of the special literature teachers is typical.

“ These teachers meet every child for a 30-minute period on alternate days. By means of stories and reading from sets of books furnished by the public library, the children are interested in the best literature. This literature teacher's class-room is, in reality, a library of literature for children, and the teacher is in the truest sense a children's librarian. Many of the books furnished by the public library are supplied in sets of 30 or 40 volumes of the same book, so that class work is possible in this directed reading.”*

One may mention that books circulated in this way under the control of the special teachers last ten times as long as the library books used otherwise.

The freedom allowed the children is another form of economy. They are not the best type of American child. They come of “ a five-year-old community of steel mill operatives, speaking 16 different languages.” Yet this heterogeneous body of pupils governs itself. In the basement, one room is the Council Chamber of Boyville, the corporate body of the school. This is the Mayor's office, and here he and the duly elected aldermen sit to pass laws for boy behaviour in and out of school. Recent enactments include one to prohibit the children of the town taking short cuts over vacant building lots near the school. A delegation was sent to the Gary City Council recently, asking them to enforce more strictly the law against the sale of cigarettes, and also to provide more dustbins for the town, into which the boys promised to put the waste-paper found in the streets. The boys and girls have also a school bank, run by themselves, with real money, pass and cheque books, and real interest on their money, which is deposited in one of the city banks at 3 per cent. The children take turns to officer their class, giving necessary orders for moving from room to room, preparing for drill, and so on. One pupil is also officer for the day in each class, and sees to the comfort of visitors, showing specimens of work and answering their questions. Another form of freedom much appreciated is the freedom to work at their special subjects, and to advance in the school at their own rates. The times during which the school is open after lesson

* From a reprint made at the school of a paper “ Utilization of the School Plant ” read before a meeting of the Department of Superintendence, St. Louis, Mo., by William A. Wirt, Superintendent, Gary, Ind. (Published in the Journal of Proceedings and Addresses of the 50th Annual Meeting of the National Education Association of the United States, held at Chicago, July, 1912, p. 494. Offices of the Association, Ann Arbor, Mich., 1912.)

hours have been mentioned. Good pupils can secure extra help from their teachers on Saturdays, and can advance in one or more of their subjects to a higher grade any month in the year, irrespective of their companions or of their status in other subjects. The work is specially organised to this end.

The motive given the children for all their work is, briefly, its immediate usefulness. The school provides a life for the child. Every aspect of life is catered for on the premises; "it is the purpose to provide a right educational environment where the child may live naturally and grow through the exercise of his self-activity under wisely directed supervision." The fact is that the child has opportunities for activity in so many directions that appeal to him at first, and so little of his time is claimed for classroom study of the ordinary type, that he becomes eager for work.

"The play impulse is transformed into a work impulse so that real pleasure is experienced in work. The school life creates a need and desire for the academic and cultural work of the school. There is no attempt to remove the difficulties. The supposed distasteful work of the school is not sugar-coated with sentimentalism. The wasted time and the mis-directed energy of the street and alley are utilized to awaken ambition, develop initiative and create power in the child, so that he can find real joy in the mastery of difficulties. The child is busily and actively engaged the year round educating himself."*

An example of this was the case of a boy who gave no satisfaction to any of his teachers, except the instructor in manual training. As soon as this fact was ascertained all his work in other subjects was stopped. He spends all his time on woodwork, with the best possible chance of growing into the other subjects in time as he finds the need of them in his work and as his brain develops owing to the use of his eyes and fingers. First, give the child healthy energy which will make him seek occupation of mind or body for every waking moment. Then, apply his work to practical ends throughout. The 10 year old children test foods in the domestic science laboratory to discover their natures and food values. Before this has time to pall, they are testing again for adulterants and preservatives. Their interest in this matter brought back numbers of the children after school hours with samples of the milk they were using at home, and formaldehyde was found in so many of these samples that one milkman in the city who had refrained from formaldehyde reaped an astonishing reward for his virtue. The manual training boys make things the school needs for their exercises, the domestic economy girls cook, and serve, and sell every day luncheons that are bought and eaten by the pupils, the teachers, and the visitors who come daily to the school. "The item of dealing with real things and feeling the responsibility of doing things right would add

* "Utilization of the School Plant," p. 493.

the very desirable element of seriousness to a child's work,"* and also the no less desirable element of contentment, satisfaction, real interest.

The idea of using every part of the school plant as an educational opportunity† has been worked out with great success and considerable economy. The upper corridors of the school, for instance, are beautifully lighted (*see* plan) and are used as museums and picture gallery. The printing and cabinet-making departments have been better than self-supporting. Two boys became so useful that they were employed in the cabinet shop throughout the summer holiday, of three months, at good pay. Other work suggested, and probably in practice by now, includes photography and photo engraving in connection with the printing, the handling of school supplies, under a teacher, who would show how to use catalogues, compare prices, judge goods, estimate costs, and so on. Then there would be valuable practice in keeping the stock in good order and tabulated. Lastly, the charge of a room, to be kept clean and sanitary by the pupils, who should be paid for such work when it is done properly.

To sum up in the words of the Superintendent:—

"The twentieth century school is planned to secure the highest possible efficiency from buildings, grounds, and equipment, and the time and energy of teachers and pupils. It gives the child, not a shop, not a playground, but a life."‡

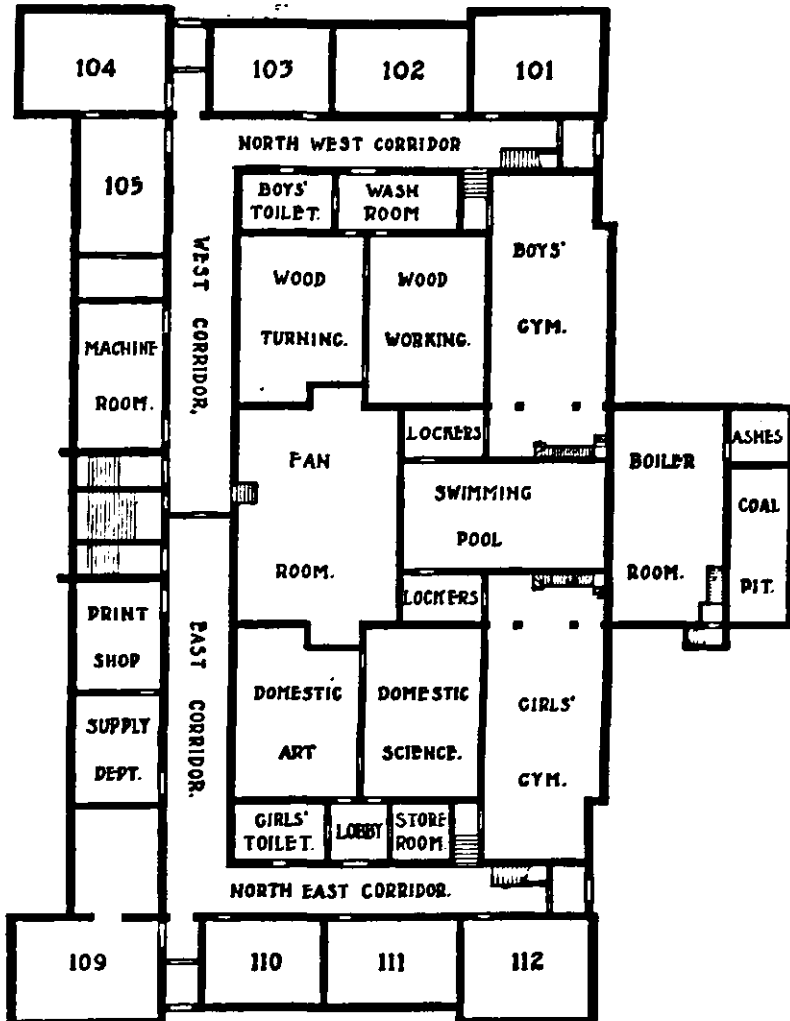
* From a reprint made at the school of a paper "Can the Administration Department of a School System serve as a laboratory for the Vocational Training of Children?" By G. E. Wulfing, Director of Industrial Education, Gary, Ind. (Published in the Journal of Proceedings and Addresses of the 50th Annual Meeting of the National Education Association of the United States, Chicago, 1912, p. 1225.)

† *See* p. 192, above.

‡ "Utilization of the School Plant," p. 495.

PLAN AND DESCRIPTION OF THE EMERSON SCHOOL.

Dimensions, 245 feet 9 inches by 141 feet 9 inches—not including boiler house.



GROUND OR BASEMENT FLOOR.

Six regular class-rooms.

Two kindergarten rooms, same size as class-rooms.

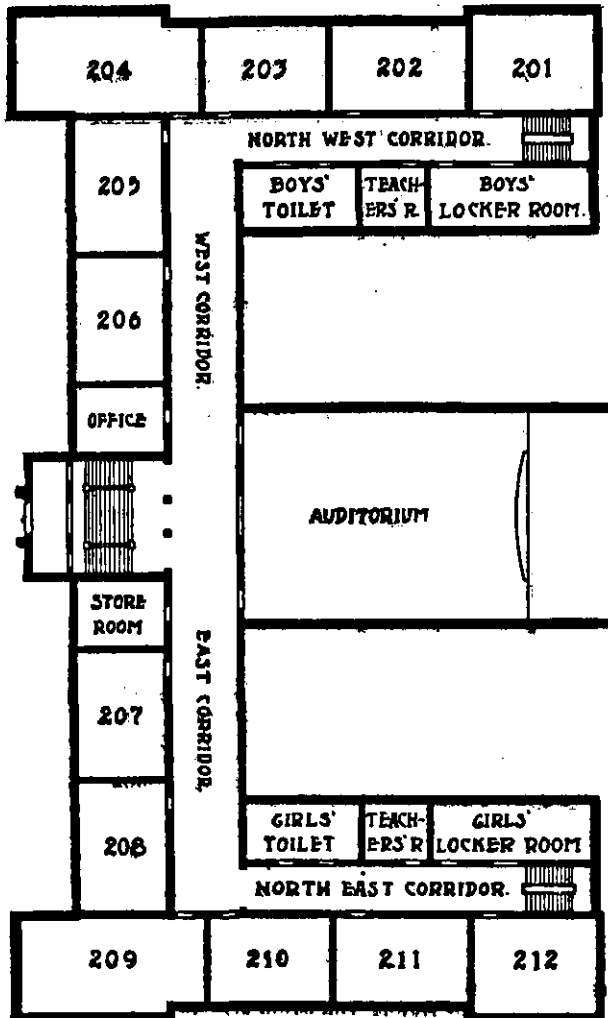
Two library rooms, same size as class-rooms.

Four manual training rooms with store-rooms, work-rooms, &c., each room as large as two class-rooms.

Two gymnasias with lockers, wash and toilet room, each the size of two class-rooms.

One swimming pool, with shower baths, the size of two class-rooms. This makes the total of the equivalent of 24 regular class-rooms in the basement. All class-rooms and work-rooms in the basement are entirely above ground.

In addition there are two large locker-rooms, one janitor store-room, two general toilet and wash rooms, rooms for heating plant, boiler-room, ash-room, and a coal-room which will hold one season's supply. The playground is 320 x 295 feet. In the basement is a corridor 16 x 180 feet which will be used in place of the playground during bad weather.



FIRST FLOOR.

Twelve regular class-rooms.

Principal's office.

Two teachers' rooms.

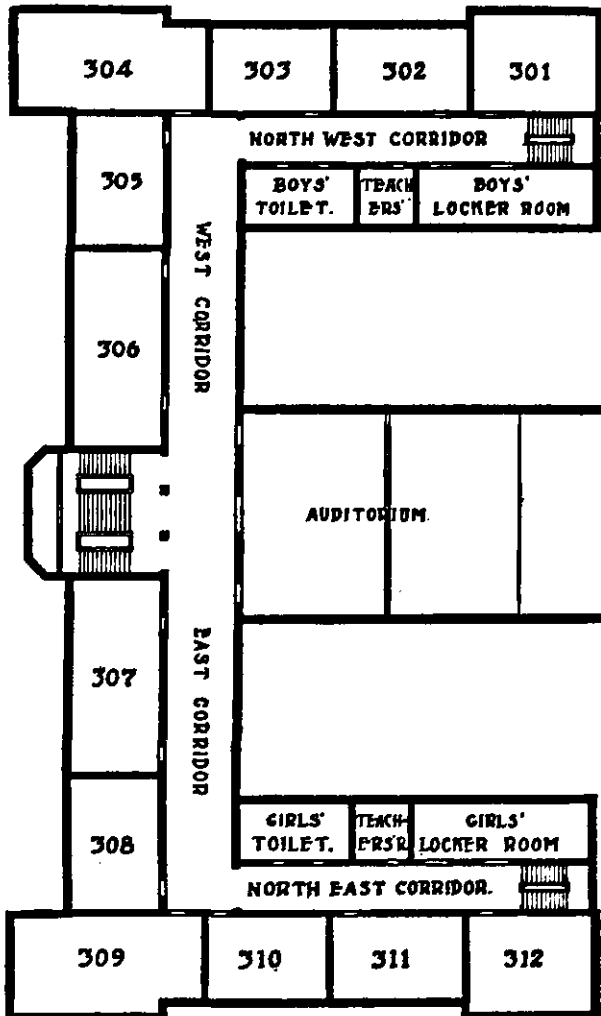
Store-room for the distribution of all school supplies.

Two large locker-rooms.

Two general toilet and wash rooms.

Main floor of auditorium seating 546 adults, with stage constructed in accordance with fire ordinance in the City of Chicago.

Large main corridor with lighting and construction planned for School Art Gallery as well as general corridor purposes.



SECOND FLOOR.

- Eight regular class-rooms.
- Two manual training rooms, the same size as class-rooms.
- Gallery of auditorium seating 278 adults.
- Two rooms for infirmaries.
- Conservatory for plants.
- Two general toilet and wash rooms.
- Two teachers' rooms.
- Two locker rooms.
- Large main corridor with lighting and construction planned for school museum as well as general corridor purposes.

THIRD FLOOR.

- One drawing-room equal in size to two class-rooms, above auditorium.

APPENDIX II.

A NOTE ON VOCATIONAL SCHOOLS IN THE
FAR WEST.

BY MISS HILDA WILSON, LATE LECTURER AT THE MOORFIELDS
TRAINING COLLEGE.

Los Angeles.—It is no wonder that the city of Los Angeles, California, has a school system which offers the most complete and varied vocational training in America, for the city itself is prosperous and favoured above all other American cities. The marvellous climate and the beautiful surroundings of this city, its great natural wealth in its fertile soil and abundant oil-wells, have drawn to it a population of over 300,000, and bring many tourists in the winter months. It is a city of gardens, for outside the central square mile every house or apartment-block stands in grounds, so that the ground covered exceeds that included in the County of London, and one can travel from eight to thirty miles from the heart of the city without crossing its limits.

In the curriculum of the elementary schools of Los Angeles, a very generous amount of time is allotted to manual work. In the first six years an hour and a half or more per week are given to this branch. Another 60 minutes is given to Drawing, which is generally correlated with the former. For instance, the writer was shown some of the productions of the third and fourth year children, which were toy figures cut out of flat wood, mounted on blocks to stand, and brightly painted. They looked like toys from a West-End shop.

Los Angeles has a number of intermediate schools, which take the pupils for the seventh and eighth years, especially those who intend to go on to high school, and give them a more specialised course which fits them better for high school work. This is an interesting attempt to bridge over the chasm between the common and the high school which should be compared with the scheme in operation at Gary, Indiana, where a much smaller population and area are catered for.

In these intermediate high schools there are three principal courses, within which a good deal of variation is possible. They are three year courses, as the first year of the High School proper can be passed in these schools. In several cases they share the building with the High School, and have the advantage of its splendid equipment.

The following is the programme of the courses, 1912-1913. English has five periods a week, Physical Training one or two periods a week, in all three years of all courses.

FIRST YEAR.

GENERAL.		COMMERCIAL.		VOCATIONAL.
	Periods a week.		Periods a week.	Periods a week.
Arithmetic	- 5	Arithmetic	- 5	Same as the General Course.
Geography or History	5	Bookkeeping	- 5	
Music	- - - 2	Stenography	- - 5	
Drawing	- - - 2	Penmanship	- - 2	
Penmanship	- - 2	Geography or History.	} 5	
Manual Training, Girls, Cooking, Sewing, Boys, Woodwork.	} 4	One of the following, French, German, Spanish	} 5	
One of the following, French, German, Spanish, Latin, Bookkeeping, Stenography.	} 5	or Music and Manual Training.	} 6	

SECOND YEAR.

History and Civics	- 5	History and Civics	- 5	Manual Training, Girls, Cooking and Sewing, Boys, Woodwork } 10
Oral English or Music.	} 2	Bookkeeping	- - 5	
		Stenography	- - 5	
Physiology and Hygiene.	} 2	Penmanship	- - 2	Drawing, Freehand or Mechanical } 5
Manual Training as First Year.	} 4	Physiology and Hygiene.	} 2	
Two of French, German, Spanish, Latin, Bookkeeping, Stenography, Algebra, Arithmetic, Freehand or Mechanical Drawing	} 5 each.	One of French, German, Spanish	} 5	General Science, with Hygiene. } 5
		or Oral English or Music with Manual Training	} 6	
				One of U.S. History, French, German, Spanish, Bookkeeping, Algebra } 5

THIRD YEAR.

GENERAL.	COMMERCIAL.	VOCATIONAL.
<p>Periods a week.</p> <p>Music or Oral English. } 2</p> <p>Three of a foreign language, Bookkeeping, Stenography, Algebra, Com. Arithmetic, Ancient History, General Science. } 5</p> <p>One of, Cooking, Sewing, Woodwork, Freehand or Mechanical Drawing. } 5</p>	<p>Periods a week.</p> <p>Com. Arithmetic - 5</p> <p>Bookkeeping - 5</p> <p>Stenography - 5</p> <p>Two of, French, German, Spanish, General Science, Algebra, Penmanship. } 5</p> <p>Music, or Oral English with Manual Training. } 6</p>	<p>Periods a week.</p> <p>Manual Training, Girls, Cooking or Sewing, Boys, Woodwork. } 10</p> <p>Drawing, Freehand or Mechanical. } 5</p> <p>Elementary Physics or Chemistry. } 5</p> <p>One of French, German, Spanish, Ancient History, Bookkeeping, Algebra. } 5</p>

There are eight high schools in the Los Angeles School District. Four large ones, Los Angeles High, Polytechnic High, Manual Arts High, and Evening High, are central, the others, Hollywood, San Pedro, Gardena and Wilmington, are in the suburbs.

"All of these schools offer courses leading to the University, and all are accredited (i.e. have the right to send students to the University without special examination). The faculties employed and the work done in these different schools are equal in rank and merit. Each has for its purpose the physical, mental and moral development of the child, and is more concerned with these than with his preparation for so-called higher academic work. While they are the same in these broad fundamental lines, each has its own personality and distinguishing features."

"The Los Angeles High School is the parent High School of the city, and is distinctively the academic, classical and cultural High School."* It is the only one offering Greek, yet "much practical and applied work, such as strong courses in food chemistry, mechanical and architectural drawing, applied art, surveying, and commerce has been instituted."* One may refer here to the wonderful "Vocational Bulletin" published by the authorities and prominent in the office of each Elementary School. This shows better than anything how each of the High Schools prepares for various forms of employment, and how the "classical and cultural" High School prepares for

* Courses of Study for the High and Intermediate Schools of the Los Angeles City School District, 1912-13.

various artistic occupations, and gives partial preparation for commercial life.)*

"The Polytechnic High School, while young in history, has had a phenomenal growth." It has well over 2,000 pupils. "It is the technical high school of the city. All but three of its fifteen or more courses are highly specialised and aim to meet the needs of those who do not intend to go directly into college. It offers strong courses in electricity, mechanical engineering, architectural drafting, assaying and commerce. As large a percentage of its graduates, however, as those of any other high school are entering higher institutions of learning." All the academic work of other high schools is offered, except Classics. This high school was visited, and as it took two hours to go through the most interesting parts of the building, its size may be imagined. It is very imposing inside and out, yet the main building is not nearly large enough for the work, and two enlargements have already encroached upon the playground. One of these is pointed out with pride, since it was designed by the young architects of the classes in that subject. It is chiefly remarkable for its fine windows. Inside this new part are the Art rooms, and one of these is fitted up for pottery making. The oven was built in the room, and the writer was offered her choice of one of the finished vases. These are designed, shaped and coloured entirely by the students, and are both strong and graceful in character. Here also sets of coloured tiles are being designed and made, which are to be set into spaces left for them on the main staircase of the new building. Near by is the architecture studio, where a girl was working at plans for a two-story house. At this school also the electrical department is very fine, and some wonderful machines are on exhibit. In the mining laboratory some boys were assaying ore for silver and gold in a small furnace. It looked very dangerous, but the director said they hardly ever have accidents. Perhaps these boys were descendants of the early prospectors who made California American. The geological museum was very fine, with exhibits of ores from all over America, and fossils and portions of prehistoric animals. A case of radium is also kept there. The courses at this school

* A study was published in 1912 of the Vocational subjects, including Commercial, offered in the high schools of California. This states that 24 of the schools offered no vocational subjects. These form 14.5 per cent. of all the high schools.

In 37 schools, 1 to 5 per cent. of the subjects are vocational.

" 21	"	5 to 10	"	"	"
" 44	"	10 to 15	"	"	"
" 23	"	15 to 20	"	"	"
" 10	"	20 to 25	"	"	"
" 6	"	25 to 46	"	"	"

The subject most frequently offered was geometrical drawing. These come in order of decreasing frequency, and, roughly, of increasing expense of equipment, mechanical drawing, book-keeping, shorthand, typewriting, commercial history, geography and law, woodwork, domestic science, forging, machine-shop work, foundry work, and architectural drawing.

can be extended for those who wish to acquire greater technical skill, and students will be able to stay there six years or longer, instead of four, if they wish to. In any case they can return to the evening classes, which are free to all residents in the city who are over 15 years old. These constitute the Evening High School, which gives all the courses of the Day High Schools as far as there is demand for them.

"The Manual Arts High School, although but two years old [in 1912] has attained remarkable success. It has already made for itself a place in the school system. It occupies a place somewhere between the classical high school and the technical high school, offering all academic subjects except Greek, in addition to the industrial work which is presented somewhat from the educational or developmental standpoint."* This high school had not fully worked out its courses in 1912, but as there are over 2,000 pupils it will probably offer as many as the Polytechnic. The different standpoint from which the work is approached is evidently set forth to the students with some emphasis, for in their yearly magazine, the Annual (they have a smaller one, appearing from time to time) which they write, illustrate, and publish themselves, a student writes very clearly and enthusiastically on "Industrial Education," but draws a clear distinction between it and manual training. He says, "We understand by manual training a thorough instruction and practice in tool and machine work, designed to improve the intellectual powers of the worker, and by industrial education the instruction necessary to produce the kinds and degrees of skill needed for the exercise of particular trades or industries."

That this intellectual ideal makes no difference to the market value of the product was evident, since numbers of useful things were being made in the metal and woodwork rooms for other schools in the city. There were some fine wooden settees, decorated with carving, destined for the corridors of a high school. All work was marked or stamped "M.A.", and there was a strong feeling evident that articles so stamped should be of superior quality and workmanship throughout. The woodwork is very successful at this school, and boys who have not had one year's course may be seen making substantial pieces of furniture, such as tables with veneered tops, large armchairs, and so on.

The Manual Arts High School has also a very beautiful building. The writer spent hours in seeing the wonderful heating and ventilating arrangements. The engine houses were not finished, but will now be used as part of the school "shops." The kitchens where the school luncheons were being prepared had a long array of machines doing the cook's work. One was mashing potatoes, another was mincing, and a third was

* Courses of Study for the High and Intermediate Schools of the Los Angeles City School District, 1912-13.

a device for washing dishes mechanically. There are several cafeterias in use at the luncheon hour. The staff have their own, but fetch their own food from the serving table. A student comes round and takes the money from each, and then they meekly pack up their trays and take them back to the appointed place. In one of the open corridors connecting three blocks of the school building there is a long counter specially built in a large recess and elaborately fitted for the serving and selling of ice-cream. This is an essential item of the menu of any school luncheon counter in America, but the writer never saw elsewhere so elaborate and deliberate a special provision made for supplying it. All the serving here and in the cafeterias is in the hands of the students. The luncheon arrangements are in the hands of the student body, who do not try to make a profit out of the sales, but generally have a considerable balance after paying expenses. The money was being counted and banked in one of the students' offices, as the writer went round after lunch to see some of their arrangements for self-government. The girls and boys organise separately for the purpose, and at two desks suitably labelled in an office near the entrance they were receiving the excuses of those who had arrived late for any lesson since the day before. Only excellent reasons were accepted, and those who could not offer them were sentenced to detention in a certain room under guard. The great school auditorium is also very striking and most lavishly equipped. The stage has three or four complete sets of scenery, all of which can be adjusted and changed by machinery, and the electric lighting is controlled by a switchboard of some 50 handles. There seem to be lights of every colour in every possible part of the stage, and the plays presented have certainly all the "atmosphere" possible.

Of the suburban high schools, the Hollywood "is distinctly cosmopolitan, comprising all of the old and new features of high school work. One of its characteristic features is the prominence given to home economics, for which work it has ideal equipment."* This study of "home economics" is not confined to cooking and sewing. It includes, with English subjects, mathematics and a foreign language, a good deal of science, general and special, home crafts such as stencilling, leatherwork and block-printing, civics and economics, household management, laundrywork, study of architecture, dietetics, sanitation, furnishing and musical appreciation. There are twelve courses at this school, including a special art course, one in agriculture, one in mechanic arts, and one in engineering.

The San Pedro High School is near the coast, and of the seven or more courses it offers the "marine" course is probably unique. The object of this course is to give preparatory training to marine engineers, boat builders, and followers of other sea

* Courses of Study for the High and Intermediate Schools of the Los Angeles City School District, 1912-13.

vocations (*see below*, Vocational Chart). The scientific work of this school is to be strongly developed with a view to marine studies.

The Gardena High School is strongest in agricultural work. It is beautifully situated in a rural district, with a large farm attached, and has a special course in agriculture, besides three other courses, and a large group of elective subjects, from a choice of which other suitable courses can be arranged. Besides the various branches of farm work, horticulture, forestry, and landscape gardening are taught. Other subjects, such as home economics, machine work and carpentry, law and the keeping of accounts, are all taught in their application to rural life.

The Wilmington High School is on a smaller scale, and only offered three courses for 1913. It prepares for commercial pursuits and provides some manual training.

The school authorities of Los Angeles are not content with this extraordinarily wide range of school work. They are anxious to open in addition a Trade School, in which the work and conditions shall be as like those of real life as possible. This school is to benefit boys who never qualify to enter a high school, and who, therefore, cannot obtain the mechanical training there offered. In almost every case where trade schools are established in the United States this would seem to be an important motive of their originators. The pre-vocational department of the Lucy Flower Technical High School in Chicago, and the Manhattan Trade School for Girls in New York, both admit girls who have not passed through the two or three last Grammar grades. In Los Angeles they wish this school to teach at least eight trades, carpentry, painting, masonry, printing, machine shop, blacksmithing, electricity, and plumbing. According to the latest accounts, such a school will be started this year or next.

Denver, Colorado.—Another western city that has a similar system of schools is Denver, Colorado. There are five High Schools in the city, and a trade school for boys. The North, South, East, and West Side High Schools offer the usual academic courses, and commercial training, and are primarily for the students of the districts in which they are built. The Manual Training High School Course is given at the North Side High School, the largest and newest of the four, for the first two years of high school life. It is not a full time course, and the work can be arranged so that more or less of manual work, and of academic work, can be taken together for these two years. The manual work will only count up to 25 per cent. of the "credits" needed for graduation. The year is divided into two terms irrespective of holidays, and in the first year boys can take joinery for one term and design for the other, spending ten periods a week on them. They have four hours drawing, free-

hand and mechanical, per week throughout the year. The girls have the same arrangement, with sewing instead of joinery, and no mechanical drawing. In the second year, the boys have wood turning and moulding for ten hours a week one term, and pattern-making the next term; also, they have mechanical drawing for two hours a week throughout. The girls have cooking, design, and mechanical drawing. The third and fourth years work in this course is to be set aside gradually in favour of the last two years of the new Technical High School Course. Thus, when a boy or girl has had two years high school with more or less manual training, he or she can choose, to complete the four years, either two years academic or commercial work, or two years technical training, with a choice of subjects, and some cultural work, or, in the case of a boy, a course at the School of Trades. The new Technical High School Course is also complete in itself, but is not all given in one building. The first year's work is given in the Longfellow School, an elementary school of which some rooms are equipped for this course. The other three years work is given at the Manual Training High School, where the manual training students from the North Side High School formerly came for the last two years of their work. At this school the hours are rather longer than in the other High Schools; from 8.45 a.m. to 3.35 p.m.

"The course is not elective during the first two years. Each student is expected to carry three academic subjects, and spend 18 periods per week in the shops or laboratories. At the end of the first two years the students of the Technical High School [Course] will have covered approximately as much shop work as is now secured in the Manual Training High School [Course] at the completion of the four years' course. At the end of the second year, students will be expected to choose some special subject for intensive work; carpentry, cabinet-making, pattern work, forge work, machine-shop work, dressmaking, millinery, catering, architecture, are among the subjects that may be chosen.

"Students will spend at least four periods per day during the third and fourth years of the course in work upon the special subject chosen. A student completing the four years course will have secured, in the first place, an excellent academic education; in the second place, a general preparation in manual training, including several varieties of manual work; in the third place, special intensive preparation for some vocation, which, while not fitting him to be immediately a skilled artisan, will have given him such training as will enable him soon to become a skilled workman. This particular training, plus the general academic and manual training, should furnish a most excellent preparation for foremen and superintendents." *

* Denver High Schools, Important Information for Parents and Students about Admission, &c., for 1912-13.

TECHNICAL HIGH SCHOOL COURSE.

English is compulsory for five periods a week throughout the Course.

FIRST YEAR.

Boys.	Periods per Week.	BOYS AND GIRLS.	Periods per Week.	GIRLS.	Periods per Week.
		Algebra - -	5		
		Science - -	5		
		Study - -	5		
Mechanical Draw- ing - - -	6			Mechanical Draw- ing - - -	2
Freehand Drawing	4			Freehand Drawing	2
Modelling and De- sign - - -	2			Modelling and De- sign - - -	4
Joinery - - -	4			Domestic Science	4
Turning and Pat- tern Making -	4			Sewing - - -	8

SECOND YEAR.

		Geometry - -	5		
		Freehand Draw- ing - - -	2		
Physics - - -	8			Chemistry - - -	7
Mechanical Draw- ing - - -	4			Mechanical Draw- ing - - -	2
Pattern Making and Foundry Work - - -	6			Design - - -	2
Forging - - -	6			Sewing - - -	6
Study - - -	4			Domestic Science	6
				Study - - -	5

THIRD YEAR.

BOYS.	Periods per Week.	GIRLS.	Periods per Week.
Two of the three :—		Two of the following :—	
Chemistry - - -	7	Physics - - -	8
Book-keeping and Solid Geometry - - -	5	German - - -	5
German - - -	5	Algebra and Solid Geo- metry - - -	5

THIRD YEAR—continued.

BOYS.		GIRLS.	
	Periods per Week.		Periods per Week.
First Term :—		One of the Following :—	
Mechanical Drawing -	4	*Household Arts Course -	} 17 or 20
Machine Shop Work -	12	*Dressmaking and Milli- nery -	
Second Term :—		Domestic Science Course -	
Technical Lecture and Laboratory Work -	4	General Fine Arts- Course -	
Selected Technical Work, with Drawing -	12	Illustration Course -	
Study (throughout the year) -	9 or 7	Design Course -	
		Architectural Course -	

* Design and Drawing are included in these Courses.

FOURTH YEAR.

American History and Civics	5	Academic Work as boys.	
German, or Mathematics, or Science - - - - -	5 or 7		
Selected Technical Work -	16	Selected Technical Work -	20
Study - - - - -	9	Course as Fourth Year (except for Millinery, which forms a Complete Course).	

The art work done in these courses is exceptionally interesting, and most carefully adapted to its purpose. Thus, at the Manual Training High School the more advanced girls were making splendid figure studies from large casts and from life, chiefly that afterwards they might design dresses on these studies, with due attention to proportion. A good deal of clay modelling was done in the first year, and one negress student showed great aptitude for this work. In several schools the progress of coloured girls in manual arts was very noticeable. The sewing rooms were adorned with numbers of charming coloured designs for simple dresses, and the girls who have entered upon a technical course are always busy during their drawing lessons in working out some practical problem which bears upon their sewing, embroidery, millinery or household decorative work. In the North Side High School, where the work is vocational rather than technical, the younger pupils produce most charming designs that could well be applied to their own surroundings. One class will be working on Japanese prints, which they copy and adapt for decorative purposes.

Then they go on to large and simple designs for rugs in coloured chalks. These rugs are such as the children weave in the schools from strips of calico or very coarse wool. One design on show was of a fat bear looking at his reflection in the water. It was broadly drawn and would be both amusing and pretty when worked up. Then they go on to designing borders, with corners, from nursery rhymes. These were inspired by the well-known books decorated by Walter Crane and Boutet de Monvel, but the ideas were the children's own. Of course all the work was daintily coloured.

The building is nearly new and very fine. It has 16 acres of floor space, and is built round a large auditorium. The Science department is most lavishly equipped, and the Colorado Museum keeps its collections in the corridor adjoining. The Manual Arts work is done in a separate building, where also the shops of the Trade School are situated. The three trades being taught were plumbing, carpentering and printing. The plumbing shop had an "upstairs" part for the baths and pipes. This course is in three parts, bending and soldering pipes, fitting boilers, testing drains and gasfitting. The printing work is especially good, and the boys do 80 per cent. of the work for the Education Authority in a completely satisfactory way.

This Trade School differs from others in the States in requiring entrants to have passed the High School entrance standard, and also to be sixteen years of age. The headmaster wants all to have had a varied technical course for two years before entrance, but this is not practicable at present. There is no labour opposition to the school, and he anticipates no difficulty in placing all the pupils after their two years' course as advanced apprentices or journeymen. They have a rather longer school day, 8.30 a.m. to 4 p.m., and there is an extra summer term of two months' shop work, so that they can work for nearly eleven months in the year. Half the school day is given to shop work, a quarter to trade drafting, and a quarter to trade mathematics, trade history and science, and to business English.

It is noticeable that no time is allotted to physical training. Under the State law, all students are physically examined once a year. The schools have voluntary clubs for games, and there is a very active Playground Association in Denver, which does much to enliven school athletics by arranging yearly displays and competitions on a large scale.

The city of *Seattle, Washington*, is working out an interesting experiment in its elementary schools. The school law makes education compulsory till the age of fifteen, and the upper grades were sometimes blocked with boys and girls who had no real interest in the ordinary academic work; many of them had come from other parts of the country and had been earning their own living before they had to return to school. For these and

others, a "Grammar School Industrial Course" has been established, and is most successful. If the headmaster thinks that some particular pupil would be benefited by this course, he recommends it to the parents for them. The object of it is to awaken these children's interest in their daily life and useful occupations. The girls are trained to be home-makers, the boys to be industrious. The official plan is as follows* :—

"Boys and girls have English, geography, history, and arithmetic. Boys have mechanical drawing and shop work, girls have drawing and design, sewing and cookery. The periods are forty minutes each. Shop-work has three periods daily, cookery two.

"English will include reading, spelling, penmanship, letterwriting and composition. Geography will include map studies, climatic conditions and influences, industries and products, exports and imports, routes and centres of trade, the studies to be correlated as far as practicable with the work in shop and kitchen. In history there will be a review of the influential events, in the development of our country, including particular reference to the country's greatest characters and their achievements, and of the causes attributing to our present national standing. The purpose will be to give an elementary knowledge of the important facts in our history and to imbue with a patriotic desire to be serviceable. In arithmetic, the fundamental operations, including fractions applied in shop-work and in local problems; percentage and interest; applications of measurements and mensuration. The purpose will be to secure accuracy in the use of figures and practice in their application to practical affairs.

"*Industrial*.—The shop instruction will consist of work intended to give knowledge of materials and their source and use; tools, and skill in their use; methods of construction; problems in machine and handwork; acquaintance with factory and individual production; the use of preservatives, as paints, oils, &c., discussions of the various vocations; visits to work under construction, to manufacturing and commercial establishments. The work will need to be under a very practical and specially competent man.

"The industrial work for girls will consist of:

"Plain sewing, garment cutting and fitting, repairing, household linens, fabrics used in the home, sewing machine, class talks and discussions regarding clothing, hygiene, style, costs, methods of manufacture, the sweat shop, trades and vocations for women.

"Plain cooking, properties of foods, economy, table service, sanitation, laundry work, care of the home, &c. Actual conditions make it possible for the girls to purchase and prepare a simple lunch daily, and to serve the same to other pupils at noon at cost. Class talks upon related topics of home life and its obligations, domestic service, income and expenditure, &c.

"Applied design in surface decoration as affected by material and service, the use of color, problems in making designs for note book covers, belts, pillows, draperies, &c. The aesthetics of the home."

This course covers two or more years, and includes some sort of vocational guidance. The supervisor of the girls' classes had inquiries made in the autumn of 1912 as to the way in which the pupils had spent their long summer holidays. It was discovered that a good proportion had taken up some work. One had made her own clothes; the course is arranged so that they learn to make everything they wear. One had made her mother's clothes. Two girls had joined together and made twenty loaves of bread every other day and sold them.

* Grammar School Industrial Course, 1912-13.

Children of this type would not go on to the High School as a rule. There are seven large High Schools in Seattle, which is a city nearly as large as San Francisco or Los Angeles, with 280,000 inhabitants, and 38 elementary schools. One of these High Schools has 2,500 pupils. Five courses of study are offered in these schools, of which three are vocational, the Commercial, Boys' Manual Arts, and Girls' Manual Arts Courses. In the last two a good deal of choice is allowed, but English, mathematics, United States history and civics and a two years' course of gymnastics are compulsory. About two-thirds of their time is spent on the vocational training with choice of languages and other subjects, such as music. In one of the newer High Schools the Domestic Arts department included, besides the usual kitchens and laundry, a small apartment with a little kitchen, diningroom, living room and bathroom. This was not yet fully furnished, as the girls were themselves choosing the furniture for it, and arranging the decorations. When ready, it was to be used for practice. Two girls at a time were to use the kitchen, and to prepare meals there for six teachers; the girls were to do the marketing, keep the accounts, and charge for the meals. A course on Home Nursing was also to be given there. In all the High School teaching of these subjects, great care is taken that the girls know the reason for everything they do. Evening classes are also carried on at these schools in vocational subjects.

San Francisco has also similar work in certain of the High Schools, chiefly in the Polytechnic High School and the Commercial High School. In *Salt Lake City, Utah*, both the public High School and that under the direction of the Latter Day Saints offer complete courses in woodwork, metal work, and domestic arts. It should be noticed that woodwork is rather more of an educational subject in those parts, for furniture has to be built up very carefully if it is to withstand the climate. No English furniture would last a year; if a cabinet, for instance, be designed with a curved front, that front has to be carried out in five ply wood, or its curve would speedily vanish. For that reason, also, furniture is usually very heavy and solid in structure.

THE TRAINING OF VOCATIONAL TEACHERS.

The Western States do not need to train all the teachers they require, for there is a constant influx from the East. Both climate and other conditions are very attractive on the Pacific Coast. At Seattle, for instance, there is no Normal School at all. San Francisco weeds out her numerous applicants by a special competitive examination, but has also a large Normal School. In this, and in the similar one at Los Angeles, there is no provision for training teachers for vocational subjects. It is curious that when these subjects are

established as an essential part of the free school curriculum, the State should make no provision for training teachers in them. In California, as elsewhere, the authorities have relied on teachers from Europe, whose thorough technical training they admire, and teachers from the large private institutions in the East. Now, however, an institution has been taken over by the State in California which will doubtless be the first of many, with the object of training teachers expressly for the advanced technical and vocational teaching required in the newer high schools. This is the State Normal School of Manual Arts and Home Economics, Santa Barbara, California.

The School began in 1891 as the "Anna S. C. Blake Manual Training School," founded by a lady philanthropist. To it went the lady who is now President, Miss Ednah A. Rich. After her training in the school she spent some years in Europe, studying various handicrafts under their most famous exponents. On her return to Santa Barbara she became Supervisor of the School and of Manual Training in the public schools. Five years ago, the State wanted to make some provision for training teachers in vocational subjects, and as this school was already famous for the quality of its work, granted it a subsidy of 1,000*l.* a year on condition that it should take and train students. Miss Rich had many applicants, but she was determined to make the training a great success, even with the limited funds allowed, so she accepted only 25 students, and chose them with very high qualifications indeed. As a result, they all got posts before their training was over. Next year she took 30 students, and had to select them from hundreds of applicants. Then the State made the school a large grant, and built them a very beautiful new building, into which they entered last year. A year ago, there were 150 students working in the little old school, and the new buildings will accommodate 300 or more.

The students are generally university graduates, and often teachers of experience as well. They must have some technical skill in addition. Miss Rich said they did not want the High School graduate of 18, and did not incline to the student who had been through the longer courses at such schools as the Los Angeles Polytechnic High School. She seems to have trained numbers of teachers who, having already taught the academic subjects in the high schools, have become convinced of the high educative value of vocational and technical work, if done and taught in the right spirit. Over 90 per cent. of the students are women. This may be because there is a woman President, but is more probably because there is so great a demand for men teachers that they need not give up time to special training in order to secure posts. The enthusiasm shown by the students is remarkable. Directly they arrive to train as teachers, they are informed that they are teachers already. If they remark that they do not know how to make

anything, they are reminded that the children know less. They begin promptly to make things, and directly they are made, to teach the children how to make them. They are supervised by all the manual training teachers in the city, who are in their turn supervised by Miss Rich, and who all understand and sympathise with her methods and ideals. All the work turned out by the students is thoroughly professional, and that accomplished by the children under their care is not far behind it. All kinds of woodwork and metal work are taught, from heavy forging and casting to jewellery in silver and other metals. Applied art includes the finest woodcarving, leather carving and staining, bookbinding, design and embroidery. Some work in architecture and house building is being developed, and the President designed the building in use a year ago. An elementary course leading to plumbing and gasfitting is also arranged. Pottery and printing are in great favour. On the domestic side, the usual subjects are studied with special reference to teaching them, and to the bringing out of their educational values. Miss Rich also intends the students to apply themselves specially to food problems in connection with the lunch rooms which will be an important part of the new building, and in which only the best and purest food will be served, after it has been thoroughly tested, cooked and prepared in the best way. She intends the students to make a study of economics in their home surroundings, and, as the State does not provide residences for them, to eschew boarding-houses and to take bungalows, two or more together, and work out healthy ways of living on 3*l.* a month, or less. Santa Barbara is not a cheap place.

In most of the State Normal Schools elsewhere in rural districts some training is given in Household Arts and Manual Work. The Colorado State Teachers' College at Greeley is an example of this, and teachers are trained there for High School teaching in the High School attached to the College, as well as in the Elementary School. But the Santa Barbara School is unique as a training college for teachers of high academic qualifications and designed solely for advanced work, above the High School standard if necessary. The period of training varies according to the number of subjects which the student wishes to complete. Some become so adept that they set up for themselves as producers of art metal work or other such things; one accepted a post as designer at the greatest jewellery house in San Francisco. This is not because they could not get work as teachers, or because they underestimate the importance of teaching. Miss Rich is very emphatic in setting forth the mental value of perfectly performed manual work, and unifies all the training by following out the ideal of her master, Mr. Cobden-Sanderson, that man and woman should learn to work together at what will build and adorn the home.

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MARINE VOCATIONS

MERCHANT MARINE - - -	Officers and engineers of coasting and sea going vessels.
NAVAL ARCHITECT - - -	Drawing and construction of vessels - -
<i>MARINE BIOLOGY.</i>	
1. AQUARIUM ATTENDANT - - -	- - - - -
2. CATALOGUER of Marine Life - - -	- - - - -
3. CHART DESIGNER - - -	- - - - -
4. CURATOR OF MUSEUMS - - -	- - - - -
1. FISH COMMISSIONER - - -	- - - - -
2. FISH EXPERT - - -	- - - - -
3. FISH PROPAGATOR - - -	- - - - -
And similar. Vocations - - -	- - - - -

THE POLYTECHNIC HIGH SCHOOL devotes itself to courses leading to all of them. All of the high schools offer

In almost all the vocations here listed, the student needs

TECHNICAL and SEMI-TECHNICAL VOCATIONS—TRADES.

ASSAYER - - - - -	Testing and rating Ores - - - - -
BLACKSMITH - - - - -	Working metals by heat, by hand or power -
CABINET MAKING - - - - -	Making furniture, interior fittings, &c. - -
CHEMISTRY - - - - -	Work in analytical laboratories, or drug or chemical supply houses.
DRAFTSMAN, ARCHITECTURAL - - - - -	Preparing plans for buildings, &c. - -
DRAFTSMAN, MECHANICAL - - - - -	Making working drawings for machines, machine parts, &c.
FOUNDRY - - - - -	Making metal castings in sand from patterns
<i>ELECTRICAL WORK.</i>	
CENTRAL STATION SUB-STATION - - - - -	Care of dynamos, transformers, &c. - -
TELEPHONE WORK - - - - -	Wiring, station work, line work, &c. - -
ELECTRIC LIGHT WORK - - - - -	- - - - -
ELECTRICIAN - - - - -	General electrical work, contracting, estimating, &c.
MACHINE SHOP WORK - - - - -	Making machines, parts, &c., by means of lathes, planes, &c.
PATTERN MAKING - - - - -	Making wood models of machine parts from which to make castings. Requires great skill and mathematical accuracy.
SURVEYING - - - - -	Field work with city or railroad parties, and office work of such survey.

Volume 1 of Special Reports (Education in England, Wales, and Ireland, France, Germany, Denmark, Belgium, &c.) (1896-7) contains the following Papers:—

1. Public Elementary Education in England and Wales, 1870-1895.
By Messrs. M. E. Sadler and J. W. Edwards.
2. English Students in Foreign Training Colleges.
By Miss L. Manley, Miss Williams, and Mr. H. L. Withers.
3. Brush Work in an Elementary School (with illustrations).
By Mr. Seth Coward.
4. The A B C of Drawing: An Inquiry into the Principles underlying Elementary Instruction in Drawing (with illustrations).
By Mr. Ebenezer Cooke.
5. Domestic Economy Teaching in England.
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