

AN ABSTRACT OF THE THESIS OF

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A review of the large tuberculin testing programs conducted in schools throughout the country and opinions of several authorities point out that more emphasis should be placed on the testing of high school students than on the testing of grade school students. By using a questionnaire, this study found that such a contention is upheld by 64 out of the 75 county health nurses in Oregon who answered.

In answer to the question relative to the following conclusion: "Although some value may be attached to the tuberculin testing of grade school children, the testing of high school students is of more significance and of greater value to the diagnosis and control program", the following opinion was expressed:

Sixty-six nurses agreed to the conclusion.
Eleven nurses disagreed.
One nurse marked in both squares.
One nurse gave no opinion.

However, in actual practice more tests are given in the Oregon grade schools than in the high schools.

The following data are condensed from the 1939 report of the tuberculin testing program in Oregon schools:

	Pre-School	Grade 1	Grades 2-8	High School
Number tested:	599	989	12,617	5,624
Positive	44	72	774	580
Per Cent positive	7.5	7.2	5.1	11.7

Figured on a percentage basis of students, the trend in recent years has been to test a little over nine per cent of the grade school students and a little under nine per cent of the high school students. Of course, the fact that the test is not repeated on high school students who reacted in grade

school will make a slight modification in the above figures.
(It is not necessary to repeat a test on a positive reactor.)

Based on statistics of tuberculin-testing programs and the opinions of county health nurses, this study contends that there is need for more emphasis on the tuberculin-testing program in Oregon high schools.

Forty-seven nurses said the suggested "Parents' Request Slip for Tuberculin Test" written in connection with this study is an improvement on the one last used in their locality. Thirty-two nurses were of the opinion that it is not an improvement.

This study contends that a well worded and carefully administered parents' request slip is a vital factor in the success of a tuberculin-testing program. Tuberculin-testing programs might not include a very high percentage of students due to faulty administration on checking the return of request slips from the homes. Opinions of several county nurses support the contention of this study that a consent slip which includes a provision for the parent to either give or refuse permission to have the child tested and a close check by the home room teacher to see that each child returns the slip, will elicit a higher number of requests. If some parents fail to give their consent, this information will be of value to health and education authorities by pointing out specific homes that may need more education regarding the test.

This study found that due to the following conditions a uniform consent slip for all Oregon schools is not practical:

1. Some schools make charges for testing.
2. Some schools elicit the parents request for the Schick test, diphtheria immunization, and smallpox vaccination on the same form.
3. Wide differences in the amount of education of parents prior to the giving of the test dictates that some request slips need little information of an educational nature while others should contain detailed information of an educational nature.
4. Some counties use the request slip for record-keeping and need certain identifying data and other information on the form that would vary from that needed in other counties.

Due to the high incidence of tuberculosis in school teachers, the 43 states not having state laws requiring the examination of all teachers for tuberculosis should enact legislation to the effect that all school employees submit evidence that they are free from communicable tuberculosis.

The study of Lumsden, Dearing, and Brown contending that tuberculin skin testing with any of the tuberculin preparations on the market (in 1939) is of questionable value or definitely futile in showing the true incidence of tuberculosis infection in the general population should not cause a curtailment of the testing in the schools. Their study does point to the importance of the quantity and quality of tuberculin used in a testing program.

Integration of all phases of school health education in the control and prevention of tuberculosis should be secured. Proper health habits that will aid in the control and prevention of tuberculosis are doubly important because they are also applicable to the prevention of other diseases.

Although this study has placed emphasis on the tuberculin test and school health education, the view that social sciences, physical sciences, and other parts of the curriculum should play an integral part in the formation of sound health habits that will aid in the control and prevention of tuberculosis is highly legitimate.

THE SCHOOL AS AN AID IN THE CONTROL
AND PREVENTION OF TUBERCULOSIS

by

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THE SCHOOL AS AN AID IN THE CONTROL AND PREVENTION OF TUBERCULOSIS

CHAPTER I

INTRODUCTION AND CONSIDERATIONS

Tuberculosis still causes more deaths in persons between the ages of fifteen and forty-five than any other disease. Lees¹ calls our attention to the fact that the high school age is a dangerous one in that one in four hundred secondary pupils will be found with the disease. The incidence increases in the college group. At Oregon State College, for example, an average of about twenty entering freshmen are found to be in need of special attention which varies all the way from a restricted college program and careful supervision on the campus in some cases to sanatorium care for others. The incidence is very high in school teachers, being about one case in forty-six or approximately 2.15 per cent.

Because people of school age are particularly vulnerable and the disease strikes very hard at the school-teacher group, it appears that the school should be vitally interested in the control and prevention of tuberculosis.

¹Lees, H.D. "Tuberculosis Among Teachers", reprint from Bulletin of N.T.A., June 1936.

Purposes of the Study

This study has as its purposes:

1. To show that healthful school living, hygiene instruction, physical education, and teacher training all have a part to play in the control and prevention of tuberculosis.
2. To show that the school is a particularly important factor in the control program through a case-finding program in students and teachers.
3. To determine in which age groups most emphasis should be placed in a tuberculin-testing program in the schools.
4. To find in which age groups most of the testing is being done in Oregon schools at the present time.
5. To prepare a well worded and well administered request slip in order to elicit a higher number of consents from parents.
6. To find the opinion of the county health nurses regarding the grades in which the test should be emphasized.
7. To find the opinion of the county health nurses relative to a suggested parents' request slip.
8. To evaluate the importance of the open air school and open air class room in the control program.

Sources of Data and Facts

This study has made use of numerous publications of The National Tuberculosis Association; books, periodical articles and special reports by authorities on tuberculosis control and school health; interviews with authorities in public health work, letters from Mr. Carl Hopkins of the Oregon Tuberculosis Association, and opinions of seventy-five county health nurses throughout the state of Oregon.

Limitation of the Study

This study is concerned primarily with pulmonary tuberculosis. Although it deals somewhat with the control and prevention program in schools throughout the United States, it is mainly concerned with the situation in Oregon.

CHAPTER II

HISTORICAL BACKGROUND

Introduction

The historical background of this study will deal primarily with the origin and development of the anti-tuberculosis movement within the schools. However, in setting the stage, a brief account of the earliest evidences of tuberculosis and some factors leading up to the part played by the school might not be amiss.

Egyptians give us the earliest evidence of tuberculosis. Meinecke¹ points to this when he mentions: "A tuberculosis disease of the spine with positive evidence of Psoas abscess has been demonstrated in mummies dating as far back as the dawn of Egyptian history". He fixes this date at about 3,000 B.C. and goes on to give a chronological arrangement showing that in 2,500 B.C. the Vedic Hymns, translated from the Sanskrit by Meader of the University of Michigan, deal with the subject of phthisis or consumption.

Although studies have traced the sequence to as early as 3,000 B.C., it is safe to say that tuberculosis existed for unknown centuries prior to that date. Because of the contagious nature of the disease and the contacts of the

¹Meinecke, Bruno, Consumption in Classical Antiquity, p. 319.

early civilizations, it is easy to see that the disease was spread from the Egyptians to the Greeks and then on to the Romans. From the Romans it spread to the Germanic invaders, then on to other people of the continent of Europe and from them to the people of the lands of our western world.

Hippocrates, called the Father of Medicine, who lived in the fourth century B.C., has no doubt been given the credit for the writings of many of his Greek contemporaries. The works of Hippocrates and his fellow Greek students of medicine demolished the idea that tuberculosis was caused by the wrath of the gods. Landmarks of Progress lends continuity to the story of the history of the fight against tuberculosis in stating:

The Greek school of medicine, which sprang from Hippocrates' teachings, long dominated thought. During the middle ages further progress was slow and few scientific advances were made. Men were content to accept the teachings of the "masters" long since dead, and research was discouraged. Phthisis was generally regarded as a hopeless malady. Nothing was known to cure it, and how it spread was a dark secret.¹

Men Who Unraveled the Mystery of Tuberculosis

The unraveling of this dark mystery was done by a host of great medical minds. Franciscus Sylvius, a Frenchman of

¹Landmarks of Progress, National Tuberculosis Assoc., pamphlet, pp. 4-14.

the seventeenth century, began to teach something of the characteristics of the disease in his description of the tubercles. Then came Rene Laennec, born in France in 1781, who suffered from tuberculosis himself. He contributed greatly to the scientific understanding of the disease through the invention of the stethoscope. Louis Pasteur, founder of the "germ theory" of disease added his important work. Robert Koch turned new light on the dark secret when he proved the direct and only cause of tuberculosis is by the tubercle bacillus. Then the great German scientist Wilhelm Roentgen gave the world a mighty weapon for the war against the "Great White Plague" by his discovery of the X-ray.

Beginning and Growth of Campaign Against Tuberculosis in United States

The date February 1, 1885 marks the beginning of the American war against tuberculosis. On that day, Dr. Trudeau established the Adirondack Cottage Sanatorium. An editorial in *The Survey*¹ says: "Here was the actual beginning of the campaign against tuberculosis in America. From this little one-room cottage have emanated the fires that have kindled a nation, and have aroused millions to action".

¹"Tuberculosis Campaign Twenty-five Years Old", editorial, The Survey, p. 606.

The passing of twenty-five years marked a great increase in the campaign against tuberculosis, or "Consumption" as it was called at the turn of the century. No words can express the progress made in those twenty-five years between 1885 and 1910 better than those of Dr. Trudeau when he spoke the following to the International Congress of Tuberculosis in 1910:

For thirty-five years I have lived in the midst of a perpetual epidemic, struggling with tuberculosis both within and without the walls, and no one can appreciate better than I the great meaning of such a meeting. I have lived through many of the long dark years of ignorance, hopelessness and apathy, when tuberculosis levied its pitiless toll on human life unheeded and unhindered, when, as Jacoud has tersely put it, 'The treatment of tuberculosis was but a meditation on death!' But I have lived also to see the dawn of the new knowledge, to see the fall of the death rate of tuberculosis, to see hundreds who have been rescued, to see whole communities growing up of men and women whose lives have been saved and who are engaged in saving the lives of others. I have lived to see the spread of the new light from nation to nation until it has encircled the globe and finds expression to-day in the gathering of the International Congress of Tuberculosis with all that it means to science, philanthropy and the brotherhood of man.¹

A few figures support the truth of Dr. Trudeau's above statement. Less than a dozen patients were treated by Dr. Trudeau in that first year while in 1909 over 117,000 patients received treatment. Whereas there was only the one institution in 1885, there were 386 sana-

¹Loc. Cit.

toriums and hospitals in 1910, along with 265 dispensaries and 394 associations, all devoted to treatment, study and prevention of tuberculosis. From an investment of only a few thousand dollars in 1885 the amount had jumped to an amount in excess of twenty-five million dollars. In 1885 hardly a single case of tuberculosis was cured and the death rate was a growing one. Dr. Trudeau, when he started his work, was almost alone in advocating that tuberculosis could be restricted and prevented. How marked a contrast to the by-word in our American schools today that "Tuberculosis is Preventable"!

Concerning the origin of agencies in the participation of tuberculosis control Jacobs¹ says: "While the first steps taken in the development of a program for the control of tuberculosis in this country were through the official health department of New York City, the initiative for the inauguration of tuberculosis programs became to a large extent the function of non-official tuberculosis associations". In keeping with the democratic spirit of America, voluntary associations made up of public-spirited and philanthropic citizens came into being after Koch's momentous announcement. In 1882 Herman M. Biggs of New York and Lawrence F. Flick of Philadelphia, established

¹Jacobs, Philip P., The Control of Tuberculosis in the United States, p. 10.

community control programs in what were then the two largest cities in the United States. Flick was untiring in his efforts. In 1895 he organized the Free Hospital for Poor Consumptives and in 1903 started the first institute for tuberculosis research on the American continent, the Henry Phipps Institute in Philadelphia. This institute was originally financed by Henry Phipps; it is now part of the University of Pennsylvania Medical School and a powerful factor in the modern control program.

Other prominent names in the growth of the movement in the control of tuberculosis in the United States are those of Vincent Y. Bowditch of Boston, who, in 1898 established the first state sanatorium (the famous Sharon Sanatorium) for the treatment of tuberculosis, and S. Adolphus Knopf, of New York, who developed the educational campaign.

The death rate of tuberculosis in 1890 was 245.4; by 1904 it had dropped to 200 (per 100,000 population). That year, 1904, saw the birth of the National Tuberculosis Association. Regarding the foundation of this organization, Jacobs brings out:

The founders of the Association saw at once that three things were imperative necessities if the tuberculosis movement was to succeed. These things were: first, a program or programs adapted to varying community conditions; second, organizations with which to execute or develop programs, and third, the funds from both official and non-official sources for the control of tuberculosis.¹

¹Ibid., p. 20.

In 1908, the Sixth International Congress was held in Washington, D.C., and had a profound effect in creating a unity of thought in this country upon a program for tuberculosis control. Much attention was given to the need for hospitals for advanced cases in an effort to cut the death rate.

Through the National Tuberculosis Association came an organization of state associations. An active program for tuberculosis control in Oregon began in 1915 when the Oregon Tuberculosis Association was formed by the National Tuberculosis Association. No funds were available in Oregon at the time, but the new State Association was able to borrow funds on the strength of its Christmas Seal contract. Of interest to Oregonians is the following statement of Jacobs:¹ "The Oregon Association was fortunate in securing as executive secretary one of the most able leaders of the country, Mrs. Saidie Orr-Dunbar, who has been largely responsible for the promotion of the tuberculosis program in her state".

Although Oregon was not a member of the National Tuberculosis Association until 1915, there had been some tuberculosis control work as early as 1903 in the state. This work started when the Oregon State Board of Health was organized. In the first year of its existence it passed an

¹Ibid., p. 363

anti-spitting ordinance and put out some printed instructions for tuberculosis patients. The Oregon State Association for the Study and Prevention of Tuberculosis was formed in 1905 by 100 physicians headed by Doctor R. E. Lee Steiner. This year saw the opening of the Portland Open Air Sanatorium with Mr. A. L. Mills acting as president of the board of directors.

A State Commission for the Treatment of Tuberculosis was created under the provision of the act of the Legislature filed on February 23, 1909. The governor appointed, in May of 1909, the following to serve as members of the commission: R. A. Booth of Eugene, A. L. Mills of Portland, Leslie Butler of Hood River, and George F. Rodgers of Salem. This commission selected a site for a state sanatorium in the Waldo foothills near Salem. The sanatorium opened in November, 1910 with 48 patients under treatment.

Oregon had only this one state sanatorium and one private institution dedicated to tuberculosis care in 1915. Counting the 38 beds on the poor farm of Multnomah County, there was a grand total of only 138 beds for the entire state. Fifteen years marked a rapid growth in the control work in Oregon. There was only the one organization in 1915; in 1930 there were 24 affiliated county associations. In these fifteen years the number of public health nurses

grew from only nine in Portland to a total of 75 throughout the state. Great gains were also made in financing the program. The Christmas Seal Sale can be thanked for increasing the funds from \$6,000 in 1915 to a sum near the \$60,000 mark in 1930 and \$82,964 in 1940.

The big task that was ahead of the Oregon Tuberculosis Association when it joined the National Association can be seen in the following words of the 1940 Annual Report of the State Association:

The Association faced, first of all, the task of building machinery for fighting tuberculosis. There were 36 counties quite unorganized for any type of public health work. Schools had not suspected that health was one of their proper interests. No chest clinics had ever been held outside of Portland. There were probably 5,000 active cases of tuberculosis in the state, less than 150 beds and no public health nurses outside of Portland.¹

A. L. Mills, Sr. was president from 1915 to 1927. He was followed by Rev. W. G. Eliot Jr. who held office in 1927 and 1928. Then Lewis G. Clarke came to office and served faithfully until 1940. The present president is Lewis H. Mills, Jr., son of the first president.

During the twenty-five year period from 1915 to 1940, associations were formed in every county of the state. The work of the State and County Associations deserve much credit for cutting the death rate from 95.2 in 1915 to

¹1940 Annual Report, Oregon Tuberculosis Assoc., p. 7.

29.8 in 1940. It is the hope of all workers in the field of tuberculosis control to eradicate the disease by 1960. If this hope is to be realized, the schools must continue to do their part, a part that has been a vital one in the program of the past.

Growth of Anti-tuberculosis Movement in the Schools

Prior to 1900 attempts at school health education and supervision in the United States were few and of a sporadic nature. According to Wood and Rowell:¹ "The beginning was made in Boston in 1894 following a series of epidemics among school children and was first directed to the discovery of contagious disease". Although Robert Koch had discovered the cause of tuberculosis in 1882, there seemed to be a lag on the part of the school in entering the work of tuberculosis control.

Dr. Trudeau in his presidential address at the first annual meeting of the National Tuberculosis Association, then known as the National Association for the Study and Prevention of Tuberculosis, made mention of the importance of using the schools as agencies in the fight against the disease when he said:

The first and greatest need is education; education of the people, and through them education of the state----Education should begin by

¹Wood, T. D. and H. G. Rowell, Health Supervision and Medical Inspection of Schools, p. 18.

teaching in the public schools the main facts relating to the transmission of tuberculosis, insisting in such teachings on the value of hygienic measures of prevention, and dwelling as little as possible on the details of the bacteriology of the disease, which would tend to produce in imaginative young minds exaggerated and fantastic impressions of the dangers of infection.²

The interest of the National Education Association in child health, including tuberculosis prevention, goes back to 1894 when a department of child study was created, followed a year later by the establishment of a Department of Physical Education. In 1911 the name of the department of child study was changed to the Department of Child Hygiene, and in 1924 these two departments were merged into the Department of Health and Physical Education. In 1937 the American Physical Education Association joined with this department and became the American Association for Health, Physical Education and Recreation, a department of the N.E.A. It was to this department that the National Tuberculosis Association in 1939, turned over its school health education program with a subsidy to continue the good work which the National Tuberculosis Association had done for such a long period.

Not only in tuberculosis control work alone, but in the broad field of child health as a whole, the National Tuberculosis Association with its state and country network

²The Place of Child Health in a Tuberculosis Program, p. 5.

of workers, was the guiding star that directed the teaching of student health from a formal and uninteresting subject, physiology, to a more dynamic interest in the student to maintain good health through the formation of sound health habits.

Among the pioneers who advocated the use of the public schools as agencies in the fight against tuberculosis, Dr. Luther H. Gulick¹ pointed out the importance of attacking the problem through the schools when he stated in 1908: "Ten out of eleven of all the children of the United States come under the jurisdiction of the public school system for approximately seven years of their lives. No other department of our government has such an intimate relation to the whole population as has the public school system to its children".

In 1908 Gulick² said: "The cases of tuberculosis which are sufficiently advanced to be discovered by the rapid examination, without the removal of clothing are obviously few----data which we have as to the extent of tuberculosis among the school children are unreliable and inadequate". The use of the Mantoux and von Pirquet tests have greatly changed the situation today from what it was at the time of Gulick's writing.

¹Gulick, Luther H. "Tuberculosis and the Public Schools", Charities and the Commons, p. 253.

²Ibid p. 254.

Gulick's suggestion for using the schools as an agency for tuberculosis control is very much in line with the program in use at the present time. He suggested:

1. The detection of tuberculosis among pupils
2. Detection among teachers and prospective teachers
3. The instruction of pupils with reference to fundamental facts regarding tuberculosis
4. The instruction of prospective teachers with reference to the fundamental facts of tuberculosis¹

Proof that the National Tuberculosis Association led the way in bringing tuberculosis-control work into the schools can be had in the following resolutions made at the Sixth International Congress on Tuberculosis in 1908:

1. That instruction in personal and school hygiene should be given in all schools for the professional training of teachers
2. That whenever possible such instruction in elementary hygiene should be intrusted to the properly qualified medical instructors
3. That colleges and universities should be urged to establish courses in hygiene and sanitation, and also to include these subjects among the entrance requirements in order to stimulate useful elementary instruction in the lower schools²

¹Ibid pp 253,254,255.

²Jacobs, Philip P., Control of Tuberculosis in the United States, p. 15.

One of the first activities of the National Tuberculosis Association in the field of child health was the promotion of open air schools for the so-called pre-tuberculous or frail children. Because so much emphasis was placed on the importance of these schools, this historical sketch of the control movement in the schools will give a brief account of their origin and growth. The first open air school in the United States was organized in Providence in 1908. There was a mushroom-like growth of these schools; a report of the United States Office of Education in 1930 showed that there was a total of 1,105 special open air classes caring for 31,186 pupils. Open Air Classrooms¹ mentions: "The impetus for the development of these classes usually came from those interested in the prevention of tuberculosis by helping the under-weight pupils".

The subject of open air schools and classrooms will be dealt with later in this study but from the historical point of view it is interesting to note the following comment by the committee reporting in 1937 on open air classrooms:

Since the time of the organization of most of these special schools or special rooms there has been an increased understanding of the tuberculosis problem in children and a

¹Open Air Classrooms, Report of Joint Committee of the N.E.A., p. 3.

changing point of view regarding weight as an index of nutrition and health. Likewise, there have been advances in school health programs as they are related to all children¹

Typical of the exaggerated importance formerly placed on the open air schools is the following extract from the Journal of Education:² "There must be special out-of-doors schools for these children (suspected tuberculous) in every city. Out-of-doors schools and classes must be established everywhere." The Mills Open Air School for frail children was the first of its kind in Oregon. This school was opened in Portland in 1918.

The observance of "Health Day" was an early innovation in the control program in the schools. To Boston goes another "first" for its establishment of the first school health day which was held on May 12, 1909.

The changing concept in tuberculosis control through the schools from the teaching of pure subject-matter physiology, emphasis on open air schools and health days to a sounder method of teaching of health habits and scientific control can be traced in the growth of the county organizations working through the state offices affiliated with the National Tuberculosis Association. Because Oregon can be used as a parallel to other states, attention will be given to the work done by its state and county associations.

¹Loc. Cit.

²Journal of Education, Editorial, March 3, 1910, p. 241.

The bold contrast of the situation today with a period of about forty years ago in the field of school health and school sanitation can be seen in the following report made by the Oregon State Board of Health in 1903:

Another disease which is not usually regarded as among the acutely contagious but which in the long run will prove so is tuberculosis. Though more difficult of immediate detection, a watchful teacher will frequently succeed in detecting a case of this disease by keeping her eyes open for such symptoms as a flushed face, unusually bright or heavy eyes, headache, morning cough and rise of temperature especially in the afternoons.

The only treatment which experience has shown to be of the slightest benefit in tuberculosis is life in the open air and this is utterly incompatible with school hours.

The public drinking cup and the public towel ought really to be abolished altogether as they may become the means of communicating at least five or six acute contagious diseases and two chronic diseases, namely, tuberculosis and syphilis--Each child should be required to bring with it a cheap tin cup, costing but five or ten cents at the beginning of each year, and a clean towel each week or month, as the teacher may deem best, and these can be kept in the desk.¹

The 1940 Annual Report of the Oregon Tuberculosis Association is in the nature of a review of the activities of the association over a twenty-five year period. The early status of health education in the Oregon schools is given in this report in a brief account of the situation in 1915 which brings out the lack of any organization

¹Oregon State Board of Health, Salem: 1903, Hints on School Hygiene, p. 9

of the 36 counties and the fact that schools had not suspected that the subject of student health was one of their proper interests.

Progress in 1916 along the health education front in Oregon was made by:

1. Employment of a nurse and lecturer
2. Education phase of the campaign was given precedence over other lines.
3. Tuberculosis literature was provided for distribution to schools.
4. The school board of Salem, through the financial aid of the women's clubs, employed the first school nurse in the state.

The educational high-light of 1917 was the beginning of the publication of "Health First", a monthly bulletin for health workers which found its way into some of the Oregon schools.

Beginning with the affiliation of the Jackson County Public Health Association, the first affiliated branch of the Oregon Tuberculosis Association, in 1918, there was a steady growth of affiliated county associations and a growing number of county public health nurses. Of course these county associations and nurses were a valuable aid to the health work in the schools of their respective counties.

The year 1919 is rather a significant one from the standpoint of Health Education in our Oregon schools. Mrs. S. M. Blumauer was added to the staff of the Oregon association for the specific purpose of starting the "Modern Health Crusade" in Oregon. She must have been a very efficient worker and the "Crusade" seemed to have a great appeal because 55,000 children of the state were enrolled in the first year.

Because the Modern Health Crusade held such a firm grip on the interest of many teachers and students for several years, a brief explanation of its nature will be given here. The National Tuberculosis Association through its state associations issued a "Chore Folder" or score card in which the student kept account of the following performances:

1. I ate three wholesome meals including cereal, vegetables and fruit and at least a pint of milk.
2. I ate morning and afternoon lunches.
3. I drank four glasses of water.
4. I used no tea, coffee or tobacco in any form.
5. I went to toilet at a regular time.
6. I was in bed eleven hours or more, with windows open.

7. I rested lying down for twenty minutes or more during the day.

8. I played in the fresh air today.

9. I washed my hands before each meal today.

10. I brushed my teeth after breakfast, and after the evening meal.

11. I took a full bath on the day of the week checked.

The score card carried a place for the signature of the student to certify "on my honor I did every chore marked on the day indicated, and the total number written on this record for each week".

The keeping of the "chores" was motivated by the students' being awarded buttons and pins of various titles such as "The Barred Cross Pin" for the first five weeks, "Chivalrous Squire" for one year's performance, then the "Knight Banneret Constant" which was a gold pin for enrollment in the Crusade for four years.

In the light of modern educational thought and methods the Modern Health Crusade is criticized for the wrong type of motivation. Most of the students were working for the pins and buttons rather than the building of proper health habits and the signature of the student's certification ran the risk of fostering cheating or falsifying. However, the Crusade acted as an opening wedge in

breaking away from the formal subject-matter teaching of physiology and anatomy that was above the level of the student's understanding and very wide of his interest.

For the sake of economy of space and in an attempt to give the reader a picture of the growth of the control program through the schools, a chronological arrangement of events will be followed from 1920 through 1940.

1920: The schools of sixteen counties were aided by public health nurses. The Oregon Tuberculosis Association added a full-time director of child health education to its staff for state-wide work in cooperation with the State Department of Education.

1921: The Executive Secretary of the Oregon Tuberculosis Association served on a special committee to work out a plan for developing health teaching in the Oregon normal schools.

1922: At the suggestion of the State Superintendent of Public Instruction, the Executive Secretary of the Oregon Tuberculosis Association assisted in the preparation of a new Health and Hygiene section for the state course of study.

1923: Appropriations were made by the association for a nutrition worker for the Portland schools.

1924: At the request of several Portland school principals, the Oregon Tuberculosis Association assumed

salaries of three trained school nurses to serve in the schools. This was important because it marked a beginning of expansion in the Portland school health service. The Executive Secretary of the association acted as the teacher for a two weeks' institute for tuberculosis workers at the University of Oregon Summer School.

1925: Public health nurses were granted certificates as Health Teachers in Oregon schools if they met qualifications set up by the National Organization for Public Health Nursing. The State Legislature passed a bill requiring school teachers to submit evidence annually that they are free from tuberculosis. The Oregon Tuberculosis Association employed a public health nurse for a year's service in Portland parochial schools.

1926: The President of the Southern Oregon Normal School was promised financial help in order to secure a teacher for his new health education department.

1927: The association added to its staff an assistant to the Health Education Department to edit "Lance and Shield", a publication for schools, later called "The Child Health Magazine."

1928: The first service of a public health nurse in the Portland high schools was financed by the Oregon Tuberculosis Association at the request of the School Department.

1930: Tuberculin testing in schools was first introduced in Oregon with 3,170 tests given in six counties. The association's Director of Child Health Education, Dr. Henrietta Morris, began contributing monthly articles for the Oregon State Teacher's Journal.

1931: The Portland Board of Education assumed salaries of high school nurses formerly paid by the association.

1931: The association participated in a state-wide conference on child care and protection. Tuberculin testing was done in eight counties.

1933: Tuberculin testing was done in twelve counties. Dr. Morris, at the request of the city school administration, began holding bi-monthly meetings of health teachers in Portland and writing for the Portland School Bulletin.

1934. The Director of Child Health Education conducted courses in hygiene at Linfield College and Pacific University and prepared a correspondence course in health education for the Extension Division of the State System of Higher Education.

1935: "Child Health Magazine" was replaced by a two-page "School Health Bulletin" for teachers. The Oregon Tuberculosis Association contributed the salary of a health education supervisor to the Portland public school system with the understanding that the supervisor would be an official school employee and that the school

board would take over responsibility for the salary after two years. This project was undertaken both for the promotion of health education in Portland and as a demonstration for the rest of the state. Tuberculin tests were given in the schools of twenty-three counties to about 20,000 students with slightly under nine per cent positive reactors. The University of Oregon made the tuberculin test an entrance requirement and found 43 per cent positive reactors and five open cases of tuberculosis among freshman students.

1936: The Oregon Tuberculosis Association issued a revised catalog of health education material. Largely through the schools, 60,000 pieces of literature on the Early Diagnosis Campaign were distributed.

1937: Tuberculin tests were given in 28 counties. Positive reactors averaged 9.2 per cent in grade schools, 11.8 per cent in high schools, 22.4 per cent in 3,526 college students and 42.1 per cent among "other adults including teachers.

1938: Construction of the new tuberculosis hospital on the campus of the University of Oregon Medical School was started.

1939: The tuberculin testing program was carried on in the schools of thirty-one counties.

1940: The Early Diagnosis Campaign was carried on in the schools of twenty-one counties. A new booklet "Nutrition in Tuberculosis" by Marion F. Wooden, Dietician at the Oregon Tuberculosis Association, and found its way into many class rooms.

Throughout three years the Oregon Tuberculosis Association promoted health instruction in Oregon schools through such activities as lectures, conferences, and study groups for parents and teachers; preparation of materials for teaching and maintaining a supply base for free and inexpensive teaching materials for Oregon Schools.

From the foregoing historical sketch of the growth and development of the anti-tuberculosis movement in the schools, one may readily see that a great deal of credit is due the National Tuberculosis Association and its affiliated state and county associations for the progressive and practical work done in the field of school health education.

CHAPTER III

THE STUDY

The School and the Case Finding Program

Introduction

A highly significant part played by the school in the control and prevention of tuberculosis is in the field of case finding. In this part of the anti-tuberculosis program the schools act as cooperating agencies with the homes, the private physicians, health departments, the county health associations, the county and state tuberculosis associations, and the National Tuberculosis Association. The schools furnish the subject (students) to be tested, a place for the testing, and the educational background for both students and parents that is of prime importance to the success of the testing program.

This part of the study, "The School and the Case-Finding Program", will be discussed under the following sub-headings: (1) Methods of case finding, (2) Tuberculin-testing programs in grade and high schools, (3) The parents' request slip, (4) Case finding in colleges, and (5) Case finding in teachers.

Methods of Case Finding

The methods employed in the discovery of tuberculosis include the tuberculin skin tests, the X-ray, and the more detailed final examination by the physician.

There are three types of tuberculin skin tests, namely, the patch test, the cutaneous test, and the intracutaneous test. The patch test employs the use of an adhesive patch covering a spot of dried test fluid placed on the arm. The skin under the test spot will redden if the person shows a positive reaction. The patch test is little used today because the cutaneous and intracutaneous tests are more efficient. However, a certain advantage is found in the patch test in that its use overcomes a rather strong prejudice held by some people against anything in the nature of a needle injection or the scratching of the skin.

The cutaneous type is the Pirquet test, named after von Pirquet, a Viennese physician who modified the tuberculin test previously devised by Koch. The Pirquet test employs a method of scarification or scratching of the skin and the administration of tuberculin to the scratched surface.

A third type, the Mantoux test, named after Doctor Mantoux, is an intracutaneous type. This is a more accurate test than the Pirquet or patch test in that a knowledge of the exact amount of tuberculin administered results from its use. The Mantoux test is administered intracutaneously by the hypodermic injection method.

Tuberculin used in these tests is derived from a culture of attenuated tubercle bacilli. These germs are grown in a broth containing glycerine. After the bacilli have been growing in this broth for several weeks, they give off toxic or poisonous substances which, being soluble, are dissolved in the broth. By a process of filtering the toxic solution is separated from the bacilli and is called tuberculin.

Two abbreviations are used rather frequently in connection with the tuberculin testing program. These are O.T. which stands for Old Tuberculin and P.P.D. which means Purified Protein Derivative, which is the active principle of O.T.

Technical procedures are of great importance in the administration of a testing program as evidenced by the following directions quoted from Diagnostic Standards:

If O.T. is used, it should be diluted with sterile physiological salt solution to such strength that 0.1 cc. contains the desired dose. Dilutions should be kept in the refrigerator when not in use and never employed when more than two weeks old. The first dose given (with the exceptions noted below) should be 0.01 mg. If no reaction occurs with this amount, 1.0 mg. is ordinarily given. In cases where extra caution seems advisable, 0.1 mg. may be used as the second dose, followed by 1.0 mg. if the reaction is negative.¹

¹Diagnostic Standards, National Tuberculosis Association Committee Report, 1940, p. 23.

The report also calls attention to the importance of smaller doses for children with discharging sinuses and recommends 0.001 mg. of O.T. or 0.000002 mg. of P.P.D. as first doses.

Interpretation of intracutaneous tuberculin tests have become standardized by committees on diagnostic standards whose findings and suggestions have been published in several editions of Diagnostic Standards, the first edition of which appeared in 1917. The 1940 edition gives the following data relative to interpretation of intracutaneous tuberculin tests:

A positive reaction is one that shows edema and redness of varying degree after forty-eight hours, or later. If there is no edema, the reaction should be considered negative.

Positive reactors may be arbitrarily classified as one, two, three or four plus, depending upon the extent of edema measured at its widest diameters. A reaction showing some redness and definite edema, more than 5mm. and not exceeding 10 mm. in diameter, is recorded as one-plus (+) reaction. A two-plus (++) is an area of redness and edema measuring from 10 to 20mm. in diameter. A three-plus reaction (+++) is characterized by marked redness and edema exceeding 20 mm. in diameter. A four-plus reaction (+++++) consists of marked redness, edema and an area of necrosis.A positive tuberculin test always means the presence of tuberculosis infection. Failure to get a positive reaction, however, does not always exclude tuberculosis. Sensitiveness to tuberculin may be absent in acute miliary or generalized tuberculosis and during some infectious diseases.¹

¹Ibid. p. 24.

Variable results from duplicated tests have caused some authorities to question the value of the tuberculin skin tests. A study by Lumsden, Dearing, and Brown on 450 children in several different schools showed:

Simultaneous duplicate tests with 1/10 second strength dose of company "A" P.P.D. and with similar dosage of another preparation the results were as follows: positive to P.P.D. of company "A" 11.8 per cent, to lot No. 511 of O.T. of company "B" 52.6 per cent, to lot No. 771 of O.T. of company "B" 78.6 per cent, to Michigan State Health Dept. O.T. 19.4 per cent, and to P.P.D. of company "C" 31.4 per cent.¹

These doctors came to the conclusion that skin testing with any of the tuberculin preparations on the market at the time of their study, 1939, was of questionable value or definitely futile in showing a true incidence of tuberculosis infection in the general population. Their study received wide recognition with two results, one beneficial to the control program and the other rather detrimental. The beneficial result is that many agencies interested in anti-tuberculosis work have been increasingly cautious about the tuberculin used in tests as to its standards of potency, specificity and stability. The result of the work of Lumsden, Dearing, and Brown that was somewhat a setback to the control program is a tendency to slacken the testing in some localities.

¹L.L. Lumsden, W.P. Dearing, and R.A. Brown, "Questionable Value of Skin Testing as a Means of Establishing Epidemiological Index of Tuberculosis Infection", Am. Jr. of Pub. Health, Jan. 1939, pp. 25-34.

Tuberculin Testing in the Grade and High Schools

The situation in Oregon presents somewhat of a typical example of the testing program in the grade schools and high schools of the states. The usual procedure is a cooperative effort on the part of the school and health officials, the county health association, local physicians, and the county tuberculosis association to test all students presenting the consent of their parents.

Tuberculin testing was started in the Oregon schools in 1930 when the test was administered to 3,170 children in six counties. A good picture of the scope and importance of the testing program in the Oregon grade and high schools is given by the 1940 Report of the Oregon Tuberculosis Association¹ in the following words: "It is generally conceded that testing of school children is chiefly of value educationally and, perhaps, in leading back through the children to adult sources of infection."

This 1940 report shows that 7,054 school children were tested, and while 324 showed positive reactions, there were no cases of tuberculosis found in this group.

¹1940 Report of the Oregon Tuberculosis Association, p.37.

Although the testing program in Oregon in 1940 failed to disclose any cases of tuberculosis in school children, most reports show that a few cases are found. A picture of the results of the testing program is given in the following summary report of the Detroit program in 1937 and 1938:¹

Age	Total Tested	Positive	Per Cent Positive	Cases
0-9	20,585	1,216	5.9	25
10-19	22,441	4,174	18.9	90
20-29	21,304	8,102	38.0	162
30-on	34,862	15,449	44.3	262

A picture of the situation in Massachusetts is given by Zacks:² "In children of school age, one in every thousand is found with the adult type lesion. For every boy, 2.8 girls are found. About five years later, at least 24 per cent of these are dead, the girls showing double the mortality of the boys."

The following pages which show the summary reports of the testing program in Oregon will give a good idea of the extent and result of the testing program in Oregon schools.

¹B. H. Douglas and G. E. Harmon, "Results Obtained in an Extensive Tuberculosis Case-Finding Program in a Large City", Am. Jr. of Pub. Health, June, 1939, p. 583.

²Zacks, David, "What We Have Learned in Massachusetts from the Ten-Year Program", reprint from New England Journal of Medicine, Sept. 10, 1931, p. 16.

*Tuberculin Tests Given in 1941

1941	Under 5 Years			5-14 Years			15-24 Years		
	No. Tested	No. Positive	No. X-rayed	No. Tested	No. Positive	No. X-rayed	No. Tested	No. Positive	No. X-rayed
Baker	10	2	0	442	30	28	209	28	20
Benton	9	0	0	417	10	4	167	4	1
Clackamas	10	1	0	148	5	2	158	6	2
Clatsop	0	0	0	1628	26	22	383	11	10
Columbia	110	2	2	845	21	21	646	6	6
Coos	39	3	1	2199	83	59	718	38	23
Crook									
Curry	8	0	0	343	32	26	102	17	14
Deschutes									
Douglas	15	2	0	606	17	7	169	31	18
Gilliam									
Grant									
Harney	5	0	0	123	4	0	0	0	0
Hood River	6	1	1	9	7	2	602	17	14
Jackson	6	0	0	710	26	25	252	24	18
Jefferson									
Josephine	14	0	0	637	23	14	66	7	4
Klamath	17	1	0	31	1	0	158	14	12
Lake	17	0	0	340	1	1	72	4	3
Lane	0	0	0	1712	55	44	390	14	7
Lincoln	47	10	6	616	33	13	306	47	11
Linn									
Malheur									
Marion	30	3	3	1472	89	78	1424	179	159
Morrow	4	0	0	142	2	0	101	1	0
Multnomah									
Portland									
Polk	7	0	0	133	4	4	4	0	0
Sherman									
Tillamook	4	0	0	488	13	2	120	3	1
Umatilla	33	0	0	1327	43	26	202	10	7
Union	0	0	0	800	23	15	249	6	1
Wallowa	0	0	0	252	17	11	95	13	12
Wasco	0	0	0	198	2	2	90	17	6
Washington	0	0	0	0	0	0	152	5	5
Wheeler									
Yamhill	23	2	2	1104	34	4	341	29	25
TOTAL	433	27	15	17525	604	416	7562	539	387

* Figures do not include University of Oregon and Oregon State College Health Service or Multnomah County.

Summary of Tuberculin Testing - 27 Counties
1941

Age	Total No. Tested	Total No. Positive	Per Cent Positive	Total No. X-rayed	Per Cent X-rayed	Total No. Cases Found	
						Pulmonary	Primary active
0-4	433	27	6.2	15	40	1 (Indian)	1
5-14	17,525	604	3.4	416	69	1 (Indian)	2
15-24	7,562	539	7.0	387	71	6	
25-44	1,822	558	29.6	403	72	10	
45 and up	533	243	45.0	185	76	3	
Unknown adults	548	161	29.3	79	49	5	
TOTAL	28,423	2132	7.0	1485	69	26	3

92% of cases of pulmonary disease were found in the age group 15 years and above.

The following data are condensed from the 1939 report of the tuberculin testing program in the Oregon schools:

	<u>Pre-School</u>	<u>Grade 1</u>	<u>Grades 2-8</u>	<u>High School</u>
Number tested	599	989	12,617	5,624
Positive reactors	44	72	774	580
Per cent positive	7.5	7.2	5.1	11.7

An analysis of the above figures shows that less than half as many tests were given in high school as were given in grades 2-8, in spite of the fact that the percentage of positive reactors in the high school group was more than double the percentage of positive reactors in grades 2-8. Figured on a percentage basis the test was given to 9.5% of the students in grade school and to 8.9% in the high school.

The importance of testing in the secondary level is brought out by Nichols,¹ who says: "School tuberculin tests should be confined to high school students, since it is in this group that the greatest number of cases will be found, and since at this age pupils are more capable of understanding the significance of the test."

¹Nichols, Pansy. "Diagnoses' Local Programs", Bulletin of the N.T.A., Nov. 1941, p. 180.

Buck¹ places more value on the testing program in high school than in the elementary school in his evaluation of local tuberculosis activities as evidenced by the following:

Tuberculin testing of elementary school population: 4 points for each 10% (up to 50%) of elementary school population tested and followed up by notification of parent or physician of reaction.

Tuberculin-X-ray testing of high school population: 4 points for each 5% (up to 50%) of population tested, provided 90% of positive reactors are X-rayed either at private or public expense.

Interviews with Mr. Carl Hopkins of the Oregon Tuberculosis Association, Miss Jeanne Gallien of the Visiting Nurses' Association of Portland, and Miss Harriet Brennenstall of the Oregon State Board of Health, lend weight to the conclusion that although some value may be attached to tuberculin testing of grade school children, the testing of high school students is of more significance and of greater value to the diagnosis and control program.

Authorities seem to be in marked agreement that the educational value of the test is of particular importance if the test is preceded by careful education of both students and parents. The proper education will give the student and his parents an appreciation of the nature and value of the tuberculin test and somewhat of an under-

¹ Buck, Carl E. Appraisal Form for Local Tuberculosis Activities, p. 15.

standing of the nature of the disease and its prevention and cure. A wealth of educational material including motion pictures, lectures and printed matter is available through the National Tuberculosis Association and its affiliated organizations.

The follow-up work of a testing program is of vital concern. This is clearly expressed by Nichols¹ who states: "A tuberculin-testing program should not be considered unless the test can be given and interpreted correctly with provisions for X-ray."

The physician's diagnoses of positive reactors will dictate the treatment necessary. In some cases it will be the duty of the school to take an active part in the follow-up work by providing a restricted program of activities for certain students and careful attention to future periodical health examinations and tuberculin tests. The obligation of the school in the follow-up program is well expressed by Langton as follows:

Upon the result of the examination of those pupils reacting positively to the tuberculin test will depend the care and treatment of the patient. Some will definitely have to be removed from school and hospitalized in sanitarium. Some upon the advice of the physician may continue in school but must receive special care and attention if they are successfully to avoid an open outbreak of the disease and thus become harmful not only to themselves but to their fellow students.²

¹Op. Cit.

²Langton, Clair V. Orientation in School Health, p. 550.

Competitive athletics which might very easily place a strain on certain adolescents through physical and emotional fatigue and an academic program that might cause excessive worry present particular dangers to be avoided.

Follow-up work in the cases that are removed from school become a responsibility of the individual, parents, private physician, public health officers and nurses and hospital or sanatorium personnel. Such follow-up work is not a function of the school and is not within the scope of this study.

Although the part the school can play in the follow-up work is limited, the testing program is very adaptable to school use. Because the tuberculin-testing program in the schools holds a prominent place in the control program, this study has attempted to find the opinion of the county health nurses throughout the state on the question of where the testing program should be given the most emphasis, that is, should more concentrated effort be placed on the test in high school than in grade school? Opinions expressed by the county nurses will be found in the part of the study entitled, "Questionnaire to County Health Nurses."

The Parents' Request Slip

The importance of securing the consent of the parents in a tuberculin testing program is stressed by Williams,¹ who says: "In the first place, special permission of parents must be secured. This limits the procedure somewhat, although Chadwick received parental consent ranging in different localities from 60 to 90 per cent."

In commenting on tuberculin testing programs in general, Proceedings of the Second National Conference on College Hygiene² states: "The number of students examined is small when compared with the total school enrollment, owing to the difficulty of obtaining parents' consent."

Regarding a compulsory Mantoux test in the public schools, Walter Durgan³ says: "It is apparent from an examination of the foregoing statutes that there is no power given the school board to make the taking of a Mantoux test a compulsory requirement for students. In my opinion, it is doubtful at the best that such a power is implied, and such doubt must be resolved against the power. Therefore, in my opinion, the board is without power to require this test of all students."

1 Williams, J.F. Administration of Health and Physical Education, p. 267.

2 Proceedings of the Second National Conference on College Hygiene, 1937, p. 88

3 Durgan, Walter, Attorney at Law, Corvallis, Oregon.

The above opinion of Durgan was written in a letter to Mr. John F. Schenk, Superintendent of Corvallis Schools, on January 12, 1940. He concludes his letter with the following: "However, under these statutes, if the board has reasonable grounds to believe in any given instances that a pupil has tuberculosis, which I understand is a communicable disease, it may require a physician's certificate from that child in accordance with the statute, as a condition of attendance."

The following quotation shows the stress placed on the consent slip in a highly successful tuberculin testing program in Claremont (California) Junior High School:

Special Bulletin to Home Room Teachers:
Please announce that all students must return the letter entitled "To the Parents of Claremont Children" on Monday morning in home room. If they wish the test, parents are to sign on the line provided. If they do not wish the test, parents are to state that fact in writing on the sheet. The point is that every parent is to see the sheet. Most parents will look upon this test as an opportunity for students.¹

A well conducted testing program will carry on an extensive educational campaign of both parents and students prior to the sending out of the request or consent slips' This can be done through Parent Teachers' Association meetings, lectures, motion pictures, E.D.C. (Early Diagnosis Campaign) literature and letters to the parents.

¹ Reprint of the University High School Journal, "A Tuberculosis Survey in a Junior High School as a Means of Health Instruction", 1933, p. 206.

Just what should be stated on the consent slip seems to be very controversial subject. Information regarding consent slips used throughout Oregon and suggestions and comments made by county health nurses on a consent slip written as part of this study will be found in the section "Questionnaire to County Health Nurses".

Case Finding in Colleges

"Tuberculosis is the most fatal disease at the age when students attend college and university." This statement by Amberson and Steihm¹ brings out in no uncertain terms the importance of case finding in colleges. Institutions of higher education are demonstrating that they recognize the importance of tuberculin testing as testified by the following figures:

<u>Year</u>	<u>Number of Colleges Using Tuberculin Testing Program</u>
1931-32	6 to 10 (estimate)
1932-33	12
1933-34	38
1934-35	42
1935-36	68
1936-37	91
1937-38	116
1938-39	143
1939-40	213
1940-41	248
1942	304 ²

1 Amberson, J.B. and Steihm, R.H., Fifth Annual Report of the Tuberculosis Committee of the American Student Health Association, 1935, p. 8.

2 From Tenth Annual Report of the Tuberculosis Committee, American Student Health Association and Report of Charles E. Lyght, Chairman working on Eleventh Annual Report.

In these 304 colleges, the tuberculin test is used by 255 institutions and 49 others employ the X-ray as their preliminary screen.

One may ask the question, "Does the case-finding method employed by colleges today really bring results?" A good answer to this question is found in the following summary:

Among approximately 145,000 students, 179 reporting colleges lacking a formal program discovered only 33 new cases of tuberculosis, 14 active; 18 left college. Among approximately 545,000 students, 304 reporting colleges with some program discovered 966 new cases, 343 active; 306 left college.¹

Doctor Charles E. Lyght, Chairman of the Committee on Tuberculosis of the American Student Health Association seems to be a writer with a real bit of color and a sense of humor. While most reports that contain statistics are very dry, Doctor Lyght's report is of a nature that makes very interesting reading. He uses the "V" for victory motive and writes his report in the style of a military communication. In a clever analogy he likens tuberculosis to the enemy, brings out that it may attack without warning. This assault is often at dawn (daybreak of a career). He calls the tubercle bacilli fifth columnists and even suggests that some officers in command (college administrators who fail to heed warnings of danger) are not on the alert.

¹ Preliminary Report of the Tuberculosis Committee of American Student Health Association, 1941, p. 2.

In a plan for defeating the sneaking foe, tuberculosis, the committee recommends:

Mantoux intradermal test --- harmless, sure, inexpensive, dosage controllable. Two-dose method --- safest, clinically correct, well worth extra effort. P.P.D. or any reliable O.T., such as Saranac Lake brand. Adequate dosage --- P.P.D. to 0.005 mg. or O.T. to 1.0 mg. Negative reactors -- retest annually; special hazard groups oftener. Positive reactors --- X-ray at once; re-ray annually or oftener if indicated. Suspicious X-ray shadows -- diagnosis demands thorough clinical evaluation. Fluoroscope --- trained personnel; "fast" type of screen; film for record. Always include college food handlers, faculty and campus personnel in any survey. People spread tuberculosis. Professors are people.¹

Numerous reports show that great progress has been made in the control of tuberculosis in American colleges in recent years. Much of this can be traced to better health service facilities and the work of the tuberculosis committees of the American Student Health Association.

The success of an active program of case finding as compared with a more passive one is shown clearly by Long and Seibert² who point out: "In seventeen colleges with 85,428 students an active tuberculosis program discovered 5.7 cases per thousand while in three other colleges without an active program the rate was only 1.2 cases per thousand."

¹ Ibid, p. 2.

² Long, E.R. and F. B. Seibert "The Incidence of T.B. Infection in Am. College Students", Jr. of the Am. Med. Assoc. May 22, 1937, pp. 1761-1765.

The article gives specific examples such as the following:

Yale: tuberculin testing and X-raying brought to light forty-three more cases in 1930-1932 than were found in the preceding ten years when only thirty-eight cases were found by the older routine history and physical examination.

University of Wisconsin: an increase of 430 per cent above a previous fourteen-year average for discovery.

Stanford: the old routine physical examination brought out only two cases in three years; with the tuberculin test and X-ray program over a similar period of time, five cases were discovered.¹

The improvement made in the control program in colleges is well stated in the Tenth Annual Report of the Tuberculosis Committee, American Student Health Association for 1939-1940² which says: "The colleges of the United States and Canada are becoming increasingly "unfair to tuberculosis".

Case Finding in Teachers

Oregon, Washington, Indiana, Kentucky and New Jersey have state laws which call for a specific examination of teachers for tuberculosis. The Washington law includes all school employees (bus drivers, custodians, clerks and

1 Loc. Cit.

2 Tenth Annual Report of the Tuberculosis Com. of Am. Student Health Association, 1939-1940.

others who come in direct contact with the students). The Oregon law includes only the teachers.

A Summary Report (1941) of the Examination of Teachers for Tuberculosis makes the following comment on the situation in Oregon:

Oregon has a state law requiring a tuberculin test of all teachers, and an X-ray of the positive reactors. This year (1941), the general physical examination required of all teachers was made optional, but the tuberculin test and X-ray are still compulsory. The program is carried out in each county by private physicians and county health departments, teachers paying widely varying prices for their X-ray films. This is the third year of the program, but no results were given other than the statement that "several cases of tuberculosis have been discovered within the last few years, not always, however, as a result of a tuberculin testing program."¹

Part of law relating to the health certificate of Oregon teachers reads as follows:

....provided further, that the holder of such certificate shall also file with the county school superintendent a certificate of health issued by a duly licensed physician, countersigned by a county health officer of said county showing that such holder is free from communicable diseases.²

Although only five states have state laws requiring examination for tuberculosis of all teachers at the present time, there is a definite trend toward the sponsorship of

1 Examination of Teachers for Tuberculosis--A Summary Report, 1941, N.T.A., p. 8.

2 Oregon Compiled Laws, p. 226.

legislation in several states by state tuberculosis associations. In many states there are local school board rulings which require examination for tuberculosis of teachers.

The fact that more legislation which may make examination of all teachers for tuberculosis a law in every state is evidenced by the following quotation from Lees:

In planning a program for the prevention and control of tuberculosis in schools, it is important that we should consider the incidence of the disease as found in various age groups. In Massachusetts where some four hundred thousand school children have been studied by means of the tuberculin test and chest X-ray, Chadwick reports that among grade school children approximately one in three thousand has tuberculosis. In high school groups, which represent a much more dangerous age period, about one in four hundred will be found to have the disease. But the incidence of tuberculosis in teachers, the majority of whom are in that age group in which tuberculosis takes its greatest toll, is found to be approximately 2.15 per cent, one case in forty-six.¹

According to Lees approximately 18,737 tuberculous teachers are today in active service in elementary and high schools in the United States.

The threat from this situation is stressed by Lees as follows:

The dangers to the child in such a situation are quite comparable to those which exist when there is exposure to tuberculosis in the home. The classroom contact between child and teacher

1 - Lees, H. D. "Tuberculosis Among Teachers", Reprint from Bulletin of N.T.A., June 1936.

is oft-repeated and prolonged and affords ample opportunity for infection and reinfection. Klein, of Germany, has investigated numerous schools in which tuberculous teachers have been employed. He has found that tuberculosis infection is two or three times more prevalent in children thus exposed than in those having no such contact. Studies in this country have revealed similar findings. Lindberg, who X-rayed all teachers in Macron County, Illinois, found the teacher of the primary grade in one school to have advanced tuberculosis. A survey was then made of the children in this school, using the tuberculin test and X-ray. In the primary grade taught by the tuberculous teacher, 40.0 per cent of the pupils reacted to tuberculin while in the third grade 8.6 per cent gave positive reactions.¹

Lees recommends that the most effective way to deal with the problem of tuberculosis in teachers is through suitable legislation.

The Committee on Tuberculosis of the Child Health Education Advisory Committee made the following recommendation at the January, 1941, meeting:

The Child Health Education Committee with special concern for the protection of children of our schools from tuberculosis calls attention to statistics from tuberculosis sanatoria throughout the land showing constant admission of school teachers who have tuberculosis. The committee therefore recommended that the National Tuberculosis Association, in order to protect children and to safeguard the health of their teachers, take specific steps to advise boards of education everywhere that teachers should be required to present annual evidence of freedom from tuberculosis such as may be provided by a tuberculin test and X-ray film.²

1 Loc. Cit.

2 Editorial, "Child Health", Bul. of N.T.A. Feb. 1941, p. 31.

Such recommendations as made above, if carried out would prevent happenings similar to the following example called to our attention by Marsh:¹

One of the interesting cases in this group was that of a woman who had been in charge of a school lunch room. For four months prior to the clinic, she had been handling all the food served the school although she had the disease in active form.

Dr. J. Arthur Meyers² in writing about the necessity for examination of teachers for tuberculosis says: "It is not difficult to conceive of teachers spreading tubercle bacilli to large numbers of boys and girls in the school system, since it has been estimated that one patient with open tuberculosis may eliminate from thirty to forty million tubercle bacilli daily."

In view of the above facts relative to the high incidence of tuberculosis in teachers and the resultant danger to the school child, Oregon shows progressive leadership in its legislation which calls for the examination for the disease in all school teachers in the elementary and high schools in the state.

1 Marsh, Margaret. "The Schoolroom--A Health Force." Survey, Nov. 15, 1925, p. 212.

2 Meyers, J. Arthur. "Significance of the Tuberculin Test." Jr. of Am. Med. Ass'n., April 17, 1937, p. 1315.

REPORT OF TEACHER CHEST EXAMINATIONS
IN OREGON

1940-1941

Total Number X-rayed - 2191

	Number	Per Cent
Showing lung changes	420	19
Requiring medical supervision	69	3
Hospitalized	2	.09

The above report was furnished by Miss Harriett Brenenstall, Communicable Disease Consultant, Oregon State Board of Health.

Control Through Healthful School Living

One of the biggest contributions the school can make to the control and prevention of tuberculosis is that of giving the child a healthful school environment. Because tuberculosis is transmitted from person to person by the transfer of the tubercle bacillus, the sanitation of the school plant is of great importance. Also, considering the fact that the bacillus can gain a firmer hold on the organism that is in a run-down condition, dictates the necessity of paying attention to all factors that will contribute to keeping the resistance of the child on a high level.

The relation of child health to school environment is touched upon by Gerken¹, who says: "School boards and school administrators need to be educated to provide school plants which are properly equipped so that children may follow essential health practices. The school should be hygenic, safe, and sanitary."

In dealing with the subject of the school and tuberculosis, Langton² says: "Healthful living within the school itself should be studied including not only sanitation of the school plant but also adjustment of the school program to the physical and mental needs and abilities of the pupils."

The selection of the school site, orientation of the building, natural light and ventilation, reduction of vertical travel, aesthetic fitness, the effects of ultraviolet rays, amount of window space, the water supply, heating system and the school custodian or janitor all play a part in the sanitation of the school plant that should lend to the development of a school environment that will aid in controlling and preventing tuberculosis.

1 Gerken, Edna A., Jr. School Health, March 11, 1941, p. 65.

2 Langton, Clair V., Orientation in School Health, 552.

Even the matter of proper seating plays a part that is not a small one. Garner¹ says in this connection: "As a slouchy posture favors the development of tuberculosis every effort should be made to counteract this vicious habit. Young people should be particularly impressed with the importance of assuming a proper posture at all times, and should be encouraged to sit and stand correctly." He goes on to bring out that the anti-tuberculosis worker has a big field of opportunity in the matter of seating, although our enriched school curriculum of today is calling for new patterns of education that do not adapt themselves to the older and more formal arrangement of class-room seating, the time will never come that will permit school authorities to overlook the importance of proper seating. Garner brings this out when he says:

A proper seating posture will at all times favor full lung capacity breathing, oxidation of the blood in a minimum of time, free exhalation of carbon dioxide, unrestricted function of the elementary systems, lessened expenditures of nerve force, and a reduction of muscular effort; conditions which tend to increase body resistance, to eliminate fatigue, to promote better health as a whole and, lastly, though by no means of less importance, to mitigate against the contraction of pulmonary tuberculosis, or--if already existent in an incipient form--to retard its ravages and abet a cure.²

1 Garner, J. R., The Relation of Posture to Tuberculosis, p. 6.

2 Ibid, p. 9.

The proper orientation of the school will take into consideration the importance of natural lighting and the beneficial effects of ultraviolet rays. The health-giving qualities of ultraviolet rays in the prevention and cure of tuberculosis were discovered by a Dane, Niels Finsen, in 1895. The work of Rollier in the Swiss Alps also added weight to the evidence of the success of ultraviolet in this field. The common silica glass used in schools will not permit the penetration of ultraviolet rays but windows can be kept open on the warmer days. The use of fused quartz, although expensive, will allow fifty per cent of the ultraviolet rays to enter; it is a good practice to use the fused quartz in the construction of rest rooms.

Poor seeing conditions often result in an undue expenditure of nerve energy with a resultant lowering of vitality. With this in mind, the orientation of the building should lend itself to the best provision for natural light.

Selection of the proper school site will provide for proper areas for play. The beneficial effects of fresh air have long been recognized by workers in the field of tuberculosis. It is unfortunate that some school sites have been selected without proper thought along the line of future expansion. This lack of foresight in some

instances has led to the construction of additional buildings on the play areas. The importance of outdoor activity in relation to tuberculosis prevention is well expressed by Langton¹ as follows: "In order to avoid tuberculosis, strength, vitality and good physical condition are important elements. The school should provide opportunity for children to spend as much time as possible in the sunlight and open air."

With the fact in mind that sound dietary habits are fundamental to the health of the student the school should provide lunch rooms that are sanitary, cheerful and free from overcrowding. Care should be taken that the noon-hour activity period should not be of a nature that will cause the students to rush through their noon meals to engage in activities. There should be a close integration of the dietary principles taught in the health, hygiene, biology, and other classes with the actual practice of students at their noon meals.

Many schools follow the practice of serving milk at certain periods of the day. Here, too, the principles taught and the actual practice should result in the using of only pasteurized milk from tuberculin-tested cows.

1 Langton, Clair V., Orientation in School Health, p. 551.

Dealing with this subject of the noon meal and its relation to tuberculosis control through healthful school living, Langton¹ says: "If the school provides cafeteria service either at cost or free to those students who cannot afford to pay, the diet of the positive reactor to the tuberculin test should have special attention. The quantity and quality of food are important, but above all the food must be nourishing."

The matter of proper ventilation enters the subject of healthful school living. Good ventilation meets the problem of maintaining body comfort by aiding it in maintaining a constant temperature. The proper system of ventilation will vary the factors of temperature, radiation, air movement and humidity in a way that will not put undue effort on the heat-regulating mechanism of the body. Proper ventilation is an aid in maintaining physical and mental efficiency and cutting down on fatigue by minimizing odors caused by volatile organic matter in the air.

In connection with the subject of proper heating as a factor of healthful school living, it is safe to say that low temperature in classrooms where children are not engaged in play or other marked physical activity is not desirable. For all children (and this includes the

¹ Ibid., p. 552.

so-called pre-tuberculous child) the best classroom temperature is one between 65° and 70°F.

Maintaining vitality and avoidance of fatigue from worry, unhappiness and anxiety dictates the necessity of a school program of studies, classes, and physical activity that will contribute to the optimum of the students' mental and physical health.

Healthful school living must take into consideration the teacher as well as the student; the total school environment must be one of sound health that will make possible a happy teacher-student relationship.

Rather than going into detail on the water supply, services of the custodian of the building and other factors contributing to healthful school living, a summary picture of desirable healthful school living will be given in the following reference:

The obligation of the educational system to the children of New York in the health field is to see that the following provisions are made:

1. A healthful physical environment, including desirable temperature conditions in the classroom, adequate illumination, seats adjusted to postural needs of individual pupils, safe drinking water, sanitary toilets, and working facilities, cleanliness and safety.
2. A healthful intellectual and emotional environment, including protection against personalities capable of exercising a destructive influence upon teachers or pupils, a curriculum and

administrative system providing for the maximum possible degree of individualization and for the application throughout of the constructive principles of modern education.¹

The writer of the above statements goes on to give the other objectives of the health program which include sound health instruction, a program of physical education, a health service program and a school hygiene program. His first two points have been quoted in detail because they give a good account of the elements of healthful school living which play an important part in a tuberculosis program.

Control Through the Health Service

Walker² mentions that according to recent definition, school health service "comprises all those procedures designed to determine the health status of the child, to enlist his cooperation in health protection and maintenance, to inform parents of defects that may be present, to prevent disease and to correct remediable defects". This definition was originated by the Committee on Terminology of the American Physical Education Association. Accordingly, tuberculin testing is a definite part of the school health service. This test is often part of the

1 Winslow, C.E.A., The School Health Program, p.102.

2 Walker, F.W., School Health Services, p. 9.

physical examination which is a good starting point for the function of the health service.

The functioning of the health service is naturally contingent upon the size of the school. However, even the smallest schools can cooperate with the parents and county health agencies in securing a tuberculin testing program.

Listed with recommendations for the college health service in regard to tuberculosis are the following points:

Intradermal tuberculin tests (Mantoux) should be done on all entering students. A repeat test on negative reactors should be given at least once each year and preferably once every six months; also when indicated by lung signs or symptoms, or by recent exposure to tuberculosis.

A careful investigation should be made of each student who shows a positive reaction, to determine any source of infection in the student's home, fraternity or rooming house, or dormitory.

Routine flat X-ray films of the chest are recommended on all new students showing a positive tuberculin reaction and should be repeated on such cases yearly.

The family physician should have an important part in the health program and health service directors should keep him fully advised of any conditions discovered in students who have been under his care. Reports regarding tuberculin tests and X-rays should be sent directly to him and whenever possible, his advice and counsel should be sought.¹

¹ Proceedings of Second National Conference on College Hygiene, 1936, p. 80.

This report also recommends follow-up work by the health service which should include the close regulation of activities of cases of healed lesions. It recommends that if students with calcified nodules are permitted to engage in competitive athletics, the responsibility for their doing so should be shared with the family doctor. The report stresses in connection with arrested pulmonary tuberculosis an X-ray examination of the lungs every six months. In cases of apparently cured or arrested pulmonary tuberculosis the student should not engage in regular physical education work or competitive or strenuous athletics of any kind. Regulation of sleep, diet, activity and adjustment of his academic schedule, social life and recreation are very important.

An interview with Doctor D. C. Reynolds of the Oregon State College Health Service disclosed that the Oregon State College Health Service is following closely the above recommendations. Each year in the neighborhood of 1,500 students are given the tuberculin test. A positive reaction is found in about 25 to 30 per cent of the students tested. On an average about twenty cases of tuberculosis are found. In some instances this means that the student must leave the campus, but in the large majority of cases the disease is not in a communicable stage, and the students remain on the campus under the careful supervision of Doctor Reynolds.

Control and Prevention of Tuberculosis
Through Hygiene Instruction

The importance of hygiene instruction in the prevention and control of tuberculosis is stressed by Terman and Almack¹ who state:

Instead of being reserved for incidental treatment, hygiene should be considered as one of the three or four most important subjects of the course of study from the kindergarten to the university. A large share of hygiene instruction could well be devoted to the causes and prevention of tuberculosis, since the instruction most effective for this purpose will be either directly or indirectly applicable to the prevention of other diseases.

These authors call attention to Gulick's emphasis upon the importance of not crowding the teaching of a topic like tuberculosis into one or two years of school life. Such a subject as tuberculosis should be taken up over a long period of years from many different angles and methods that can be well adapted to the child's understanding. The tuberculin test is of great educational value with the proper integration of hygiene instruction.

Gulick, Terman, and Almack stress that in the early years the instruction should be of a nature to inculcate habits and ideals. At this stage it is not necessary or desirable to impart specific information regarding the nature of tuberculosis. In the first two grades it is not necessary to mention the word "tuberculosis".

¹ Terman, L.D. and Almack, J.C., The Hygiene of the School Child, p. 160.

The authorities mentioned above bring out that in the third and fourth grade more specific instruction should begin and should be planned so that each year a new aspect of tuberculosis is made familiar to the pupils. By this method one grade can stress the value of fresh air and outdoor life, another grade the relation of tuberculosis to alcohol, fatigue and ill-nourishment. Still later the social and economic aspects of the problem should be taken up. Necessary knowledge related to physiology and anatomy should be worked in over a period of years according to the child's ability to understand.

A continued program of hygiene instruction to help in the prevention of tuberculosis is emphasized by Terman and Almack¹ in the following words: "Year after year, while taking care to avoid the inculcation of an unreasoning fear, the instruction can be driven home and the child made to appreciate the necessity of so ordering his life as to insure a reasonable security from the disease."

The importance of the formation of proper health habits stressed by the above-mentioned authorities is expressed well by Bauer who says that the schools should teach health, not disease and summarizes what the doctor wants the school to teach in the health field as follows:

¹ Ibid, 162.

1. Health, and not disease
2. How to live, and not a short course in medicine
3. Protection and effective use of the body
4. Personal responsibility for personal health
5. The responsibility of the citizen for community health¹

A valuable aid for the hygiene teachers in the junior and senior high schools has been worked out by the National Tuberculosis Association in the nature of a teaching unit. This is a fourteen-page teaching guide entitled "Preventing Tuberculosis"; it is recommended as a teaching unit to precede the tuberculin test. Valuable suggestions are made for an approach to the teaching, teaching procedures, tests, and activities. Many hygiene teachers will find the parts of the unit entitled "Basic Subject Matter for the Teacher" a real help. The unit is divided into five problems as follows: (1) Why should teen-age boys and girls be particularly interested in the prevention of tuberculosis? (2) What protection can boys and girls develop against tuberculosis? (3) Why is tuberculosis more difficult to conquer than any other childhood disease? (4) Do we have reason to believe that we could get rid of tuberculosis almost completely?

¹ Bauer, W.W. "Teach Health, Not Disease", The Jr. of Health and Phys. Ed., May, 1941, p. 298.

(5) How can a junior and senior high school pupil take part in a program for the prevention of tuberculosis?

A list of reference materials including pamphlets, motion pictures, slides, and graphs add to the teaching value of this unit.

The Proceedings of the Second National Conference on College Hygiene (1937) recommends that the instruction in tuberculosis on the college level be introduced by a discussion of the hazards of tuberculosis at college age. This discussion can use as its starting point statistics on morbidity and mortality by age, sex, and occupation.

An approach suggested in the teaching unit for high school students which mentioned that the all-American football player, Albie Booth of Yale, developed tuberculosis, might fit into the introduction of the subject of tuberculosis in a college hygiene class.

The following suggested topics for a college hygiene class may be presented after a good approach and some historical data leading to Koch's discovery have been presented:

1. The tubercle bacillus and how it produces tuberculosis. The less important varieties of tubercle bacilli found in cattle, birds, and fish; emphasis on the human strain. The different kinds of tuberculosis lesions, healed, quiescent, and active; how children, adolescents, and adults usually react to tuberculous infection.

2. How tubercle bacilli are spread. Bovine tuberculosis--importance of pasteurization. Human tuberculosis; moisture droplets and sputum infecting agents; their high resistance to drying, oxygen, and sunlight.
3. Methods of prevention. Newer methods in searching for early cases contrasted with older methods of waiting for well developed symptoms.
4. Care of tuberculosis. Medical supervision of quiescent lesions to prevent their becoming active; sanatorium care--surgical therapy.
5. Community resources for combating tuberculosis. Periodic health examinations by family physician; health service and health teaching in public schools; health department; state, county, and city sanatoria; educational and special services by local tuberculosis associations.
6. Personal methods of prevention. Avoidance of infection; maintaining good health; cooperation with family physician and public health authorities for continuous health service from birth to old age.¹

Control Through Physical Education

Williams² defines physical education as "the sum of man's physical activities, selected as to kind and conducted as to outcome." The selection of physical education activities in the school and the conducting of these activities deserves consideration in the program of tuber-

¹ Health in Colleges: Proceedings of the Second National Conference on College Hygiene, 1937, p. 85.

² Williams, J.F., Organization and Adm. of Phys. Ed., p. 40.

culosis control and prevention. Authorities point to definite assets and liabilities adherent in physical education in relation to the control of tuberculosis.

Terman and Almack bring out one of the assets of physical education in saying:

Exercise and habits of breathing both have an astonishing influence on vital capacity, which has been known to increase as much as three hundred cubic centimeters in three months. Deep breathing helps to determine the rate of oxidation of the blood, but is less a factor in this than exercise.

The size of the lungs, however, is probably less related to health than is their right use. The chief danger lies in harboring unused lung tissue. The importance of right lung development and the cultivation during childhood and adolescence of right habits of breathing and exercise can hardly be overestimated. The fate of those who have a tendency to tuberculosis is usually sealed before the close of the adolescent period.¹

According to the authorities just quoted, the excessive mortality of adolescent girls over that of boys is due somewhat to such factors as greater vital capacity of boys and the use of lung tissues due to the outdoor activity of boys and a tendency on the part of the girls for more sedentary indoor habits. The fact that girls who live in the country show a greater vital capacity than city girls indicates a need for well selected and conducted physical education activities for girls.

¹ Terman, L.M. and Almack, J.C., Hygiene of the School Child, p. 58.

The vital necessity for a physical examination, tuberculin test, and X-ray of positive reactors for all students taking part in the more strenuous physical activities of a physical education program is clearly brought out in the following quotation:

It is all too common when the search is made by school physicians to find students with early tuberculosis playing on football or basketball teams. This is a dangerous situation because the symptoms if present at all may be so slight as to excite no alarm. As the result of indifference, the disease is allowed to progress to the serious stage.¹

From the first grade through college it is necessary for those in charge of the selection and conduct of physical activities for boys and girls have a clear understanding of the biological laws of growth so the physical education program will aid in the control and prevention of tuberculosis. Because the physical education program can aid or hinder the control program, the following words of Langton should be kept in mind:

Hence it is necessary to provide a fine balance between the amount of play necessary for the development of fundamental muscles and at the same time not to place too great a strain upon the heart, digestive system, etc. If this is to be accomplished satisfactorily, intelligent study and direction must be given to individual needs of pupils. It is important to remember that each child is an individual problem. Mass programs with total disregard of individual differences find no place in the modern scientific program of the school child.²

1 Preventing Tuberculosis, A teaching unit, p. 9.

2 Langton, C.V., Orientation in School Health, p. 392.

Open Air Classrooms

Early in the control program much emphasis was put on open air schools and open air classrooms for the so-called "pre-tuberculous" children. Today the term "pre-tuberculous" is considered a misnomer as evidenced by the following:

Tuberculosis is a disease caused by the tubercle bacillus. Therefore, no child, even though he be pale or underweight, will have tuberculosis unless he actually takes the bacilli into his body. The likelihood of effective exposure depends upon many factors other than the child's physical condition. Therefore, the term "pre-tuberculous" is no longer acceptable and its use should be discarded.¹

Open air schools had their origin in Germany. These schools were held only in the late summer and early fall in most cases and while they were extended into the summer months in some localities, they were never in session in the winter months.

The cry for open air schools and classrooms swept through the United States after the first open air school was organized in Providence in 1908. A report in 1930 by the United States Office of Education showed that there were a total of 1,105 special open air schools caring for 31,186 pupils. Because this condition was brought about largely through the efforts of the National Tuberculosis

¹ The physically Below-Par Child. N.T.A., p. 5.

Association, the association felt a need to review the situation relative to open air classrooms in view of changing concepts in the tuberculosis control program. Consequently, a study was made by the association and a report was brought forward by a committee in 1940. This committee¹ makes the following statement: "Experience has indicated that in the majority of children between the ages of 5 and 15 years, tuberculosis disease is relatively unimportant. In this group the tubercle bacilli are apparently walled off within the body tissues and cause little damage."

This report brings out in its conclusions that there are a few children who through X-ray evidence and the examination of a physician are shown to be ill with tuberculosis. Of course these children are cases for sanatorium care, or at least more attention than would be given to them in an open air room at school.

Open Air Classroom mentions in its introduction:

Since the time of organization of most of these special schools or special rooms, there has been an increased understanding of the tuberculosis problem in children and a changing point of view regarding weight as an index of nutrition and health. Likewise, there have been advances in school health programs as they are related to all children.²

1 Ibid, p. 6.

2 Open Air Classrooms, N.T.A., p. 3.

The report quoted above discussed the features of the open air class program under the following headings:

1. Ventilation and Heating
2. Feeding
3. Practical Health Instruction
4. Improved Home Care
5. More Individual Attention
6. Rest Periods

Of particular importance is the following statement of fact:

At one time the temperature of open air schools and classrooms was approximately the outdoor temperature. In other words, they were outdoor schools. With the development of these classes in parts of the country where severe winters were experienced, many cities set 60° as the minimum temperature permitted and supplied extra clothing for pupils to wear when this low temperature was reached. Recently, there has been a definite tendency to emphasize a free circulation of fresh air but to have the room temperature approximately 68°F. There has never been any evidence that extremely low temperatures were beneficial, and it is quite likely that the loss of heat resulting from low temperatures would be detrimental to undernourished anemic children.¹

Through advances made in healthful school living today's schools seek to give most of the advantages offered by the open air classes to all school children and not just the below-par child. This is brought out by the report as follows:

¹ Ibid, p. 5.

A study of the six features will reveal that the first four (1. Proper ventilation and heating, 2. Feeding, 3. Practical health instruction, 4. Improved home care) should not be limited to open air class programs and are now found in all schools that have developed an up-to-date school health program. The open air class pioneered; it led the way particularly in school ventilation and in practical health instruction. Nowadays many things which were considered advantages available only to those enrolled in special classes are a part or should be a part of the general school program.¹

The trend of thought of most authorities today in light of advanced and changing concepts in tuberculosis control is well expressed in the following:

Because open air classes were developed with the hope that they would aid in the prevention of tuberculosis, it is fitting that this report take cognizance of recent developments in the story of tuberculosis. In light of our present knowledge, it appears that a program of case finding will be of more value in combating tuberculosis than the placing of certain children in open air classes.²

Teacher Training and Tuberculosis Control

The effectiveness of the school as an aid in the prevention and control of tuberculosis through the formulation of proper health habits in the students depends, to a large extent, on the teacher's being prepared to participate in a sound health program. Rugen³ stresses

1 Ibid, p. 7

2 Ibid, p. 10

3 Rugen, M.E. Problems for Methods and Materials in Health Education, p. 52.

this by saying: "Colleges, universities, and normal schools with teacher training curricula, have a definite responsibility to elementary and secondary schools. Helping teachers to develop a sound health education point of view should not entail the addition of many courses to the teacher training curriculum".

Studies made by the American Student Health Association and the National Conference on College Hygiene indicate that college and university departments of hygiene, public health, health service, and physical education exert a stronger leadership in the field of general health instruction than do other courses. This leadership in our secondary and elementary school has centered around the health examination, courses in health, hygiene, biology, and physical education.

That there is room for improvement in teacher training for health leadership is brought out by Rugen as follows:

On the teacher education level there seems to be a definite need for the evaluation, integration and enrichment of courses included in the professional curriculum in order that the health objective, presumably recognized as the first objective of all education, may be realized. Cooperative effort between departments and schools of education and those of hygiene, public health, health or physical education in specific colleges, universities and normal schools should result in more effective preparation of all teachers of elementary and secondary school pupils.¹

¹ Ibid, p. 54.

With this thought of integration in mind, Wootten¹ says: "It is important that all teachers of health and physical education understand the basic health implications in all physical activities and in the entire extra-curricular leisure program".

One of the objectives of the first National Conference on College Hygiene which met at Syracuse University, May 5-9, 1931, was the formulating of standards for the training of health instructors as follows:

1. One year of biological and physical sciences
2. A subject matter course in personal and community health
3. Subject matter course in health education, at least three semester hours

Important facts which must be emphasized in the education of the health teacher and other social workers are:

- a. Diagnosis of physical defects and disease is not the layman's problem but the doctor's problem.
- b. The intelligent cooperation of the lay health worker with the well trained doctor is one of the basic needs of preventive medicine.
- c. Mental, emotional, and social hygiene should receive attention as well as physical hygiene, both in the teacher's own life and in the health education program, which must revolve around the needs of each student.²

1 Wootten, K.W., A Health Education Workbook, p. 8

2 Op. Cit.

It is very unfortunate that all schools engaged in teacher training have not recognized that all teachers, regardless of their teaching fields, should have some training that will enable them to integrate the formation of health habits through their particular subject. The students' health should be of real importance to the English and history teacher just as it is of importance to the instructor of hygiene or athletic coach. This fact was recognized by "The President's Committee of Fifty on College Hygiene" in its report at the Second National Conference on College Hygiene in Washington, D.C., in December of 1936. According to *Health in Colleges*¹, the committee reported "Much more attention needs to be given to teacher training not only for the teachers of health education but for the teachers and educational workers of all kinds. All aspects of physical and mental health need strengthening in the education of teachers".

In regard to the specific subject of hygiene instruction for the future teacher the report sets forth:

The hygiene department of the teacher training institution, or the university, including a college of education, has a distinct and responsible service to perform. Its professional courses in hygiene for teachers should make the future teacher health-minded and develop in him a modern philosophy of health education. Health is a fundamental factor in the training and preparation for citizenship since the health of the boy

1 *Health in Colleges*, Second National Conference on College Hygiene, p. 46.

and the girl materially determines endurance, disposition, and attitude, and these qualities vitally affect happiness and efficiency.¹

For the teacher who will work in specific health classes, certain training in science is basic. The committee took cognizance of this in stating:

Inasmuch as a scientific attitude toward life in general and health in particular cannot be developed without some scientific background, it is recommended that certain basic sciences should be included in the general subject matter required in teacher training institutions. This training would include a subject matter course in personal and community hygiene based on elementary physiology, anatomy, and bacteriology; a subject matter course in mental and social hygiene and healthful school living, a course on methods in health education, and lastly an observation and practice teaching course in training school or a public school system where the teacher will have an opportunity to participate in a progressive school classroom health education program. In conclusion, it is further recommended that nine semester hours should be regarded as the minimum time allotment for the required hygiene courses exclusive of the basic sciences and practice teaching.²

The marked decline in the death rate of tuberculosis is to a large degree the contribution of preventive medicine. According to Wootten:³ "Health Education is the practical application of these scientific findings to daily living". In this light it is the responsibility of every teacher to see that his work is based on the most recent authentic findings in his field.

1 Ibid., p. 94.

2 Ibid., p. 95

3 Wootten, K.W. A Health Education Workbook, p. 14

Questionnaire to County Nurses

On March 17, 1942, the following form letter, Parents' Request Slip for Tuberculin Test, and Questionnaire were mailed to 93 county health nurses:

3105 Jackson Street
Corvallis, Oregon
March 17, 1942

Under the direction of Doctor Henrietta Morris of Oregon State College and with the cooperation of the Oregon Tuberculosis Association, I am writing a Master's thesis at Oregon State College on "The School as an Aid in the Control and Prevention of Tuberculosis".

As part of this study I have worked out a suggested "Parents' Request Slip for the Tuberculin Test". In working out this request slip I had in mind that a provision for the parent to check in either one of the two squares and an attempt on the part of the school to see that all students return a slip, will elicit a higher number of requests than has been obtained in the past.

Will you please read over the enclosed request slip and return the enclosed questionnaire in the self-addressed envelope?

I will send you a copy of the results of the questionnaire. Also, I expect to submit articles to THE OREGON EDUCATIONAL JOURNAL and THE BULLETIN OF THE NATIONAL TUBERCULOSIS ASSOCIATION.

Because our spring vacation at Oregon State is being omitted and the school year will come to a close in May, due to the national defense needs, I am rushed to complete my thesis and other college work, so I will greatly appreciate your answer at your earliest convenience.

Yours very truly,

James A. Carr

Parents' Request Slip for Tuberculin Test

Dear Parent or Guardian:

In the interest of the health of your child and of the other students, a tuberculin test is being offered free of charge at school. This is a simple, safe and harmless test that leaves no scar; it will be administered by a physician.

Forty-eight hours after the test is administered, the reaction is observed. If there is no reaction, the child normally does not have tuberculosis. If there is a reaction, further study by means of an X-ray picture is advised. A reaction does not necessarily indicate that the child has tuberculosis but it is a warning sign that says: "Have an X-ray picture taken and let your doctor decide".

May we have your cooperation?

Please check (x) in one of the squares below:

☐ I request the service here offered.

☐ I do not wish to obtain the service here offered.

Parent's signature _____ Date _____

Student is asked to please return this slip to his teacher.

Questionnaire

Information requested by James A. Carr
Oregon State College

March 1942

Question No. 1:

Do you believe the enclosed Parents' Request Slip for Tuberculin Test is an improvement over the one last used by the schools in your locality?

Please check (x) in one of the squares.

Yes

No

*Comments and suggestions:

Question No. 2:

One of the conclusions reached in my study is, "Although some value may be attached to tuberculin testing of grade school children, the testing of high school students is of more significance and of greater value to the diagnosis and control program".

Please check (x) in one
of the squares

Agree with above state-
ment

Disagree with above
statement

*Comments:

If convenient, will you please send me a copy of the Parents' Consent Slip last used in your locality?

Nurse answering questionnaire _____ County _____

*Please use reverse side if you need more room for comments and suggestions.

Response to Questionnaire in General

The questionnaire elicited a response of 80.61 per cent. Letters were sent to 93 nurses in 35 counties; answers were received from 75 nurses in 33 counties. Forty-five nurses were of the opinion that the suggested Parents' Request Slip was an improvement over the one last used by the schools in their locality. Thirty indicated that it was not an improvement.

Sixty-two nurses agreed to the conclusion that "Although some value may be attached to tuberculin testing of grade school children, the testing of high school students is of more significance and of greater value to the diagnosis and control program". Eleven nurses indicated that they did not agree to the conclusion, one nurse gave no answer, and one nurse checked in both squares indicating that she both agreed and disagreed

Some Affirmative Responses to Question No. 1

The following comments were made by some of the nurses who marked "yes" in answer to the question: "Do you believe the enclosed Parents' Request Slip for Tuberculin Test is an improvement over the one last used by the schools of your locality?"

Miss Barbara Hansen, Grant County: "I am keeping your form thinking I can use it for a sample in testing of high school groups in May."

Miss Virginia Pierson, Baker County: "I like the clear-cut method of explanation used in your suggested form. There need be no question in the mind of the parent as to the procedure of tuberculin testing--no alarm about results."

Mrs. Edith Phipps, Josephine County: "We have no specific request slip for tuberculin testing. When we go into a school, they send out notices that a tuberculin testing clinic is to be held on a certain date requesting parents' consent. No explanation of the test is given. I think your sample copy is excellent, and I hope it will be adopted throughout the state soon. I shall try to persuade this county to adopt it. I think it is most worthwhile to give an explanation of the test and no doubt more would have the test if they understood it."

Miss Helen Marcy, Lake County: "This request slip is concise and easily understood as well as a bit educational and seems better to me than the one used here previously except that it could also include the child's name, date of the test, and result. The important information relative to the test would all be included on one form. This would serve to save time and some confusion, I think."

Miss Helen Fisher, Supervisor of Public Health Nurses, Portland: "I do feel that the form 'Parents' Request Slip for Tuberculin Test' is a very good one. It is well worded and concise and quite complete. I wonder - and I believe Doctor Carey mentioned it to you - if some space for notice of previous test and results shouldn't be provided? Wouldn't it be of value to have a place for name of family physician on request slip? We have found it very valuable, especially in our high school group, if the public health nurses would consult the family physician before talking to the parents."

Miss Florence Weisser, Clackamas County: "I believe your T.B. request form is better than the one used in this county. Your statements and explanation of both test and positive reaction are excellent, as well as clearly stated facts that leave no doubt in the mind of the parents."

Miss Hannah Sandquist, Coos County: "We have experienced no difficulty in getting a return of slips from grade school children. Our trouble is with high school students who are so engrossed with other things that they fail to take a slip home."

Mrs. Helenmarr Hammer, Deschutes County: "It is a simpler, briefer form, using the same idea."

Miss Eva A Davis, Hood River County: "Requires return of slip regardless of answer; negative return slips could be used later in the educational program."

Suggestions for More Data

The fact that many county health nurses use the request slip for record purposes and not just as a means of eliciting consent of the parent is brought out by the following suggestions for more information to be given on the request slip:

Information as to previous test	3
Child's name.	12
Child's age or birth date	9
Name of school	3
Grade in school	6
Date of test.	4
Home room	1
Family physician.	3
Name of county health officer	1
"More identifying data"	3
Result of test.	2
Child's address	5
Signature of principal.	2
Signature of county health officer.	2

Some Negative Responses to Question No. 1

Thirty nurses believed the Request Slip suggested was not an improvement on the one last used in their county. As mentioned above, a number of nurses want certain identifying data on the slip.

The following are some comments by nurses who did not believe the suggested Request Slip an improvement:

Miss Lucy Davison, Wasco County: "A charge should be made except for those who cannot pay."

Miss Esther Scott, Clackamas County: "The second paragraph is somewhat too wordy. In a way the check marks are good in that the parents at least let you know whether they wish the test or not. However, we have found that parents get confused over check marks, and signing a paper for consent has been a little more successful."

Miss Mabel Kirschman, Lane County: "The form might lead parents to object to the test because of the expense of the X-ray which is suggested."

Miss Shirley Christiansen, Lane County: "Do not like 'May we have your cooperation?' Parents should be given credit for being interested enough in their child's health to cooperate. I prefer the statement: 'I request this tuberculin test for my child'."

Mrs. Lu Dema Nance, Malheur County: "We do more than tuberculin test, and all are on one slip. I do think this is a very good form if only one test was given."

Mrs. Jean Fack, Linn County: "The simpler the form the better the results."

Miss Margaret Portmann, Wasco-Sherman Public Health Department: "The content of your request slip is very good. But how does the parent know if there is a reaction? Also, we like a little more identifying data about child, school, grade, teacher, etc."

Mrs. Geraldine Betts, Clackamas County: "Your statements are very clear. The sentence structure is good. If we could make the request shorter, the parents will take time to read it and sign. If it is long and complicated, a parent just lays it aside. Parents often mark (x) in both blocks or the wrong block. Would it be better to make sentence requesting the tuberculin test followed by a blank for signature?"

Mrs. Irene C. Sanders, Linn County: "This slip sent is very good. However, it: (1) Uses too much paper to begin with (a budget must be considered); (2) Never give parents a chance to refuse, poor psychology. If you are sure it is good, don't put a doubt in their mind by saying 'Do you think so?' The positive attitude teaching has been done in the class room before the clinic date, so

explanation is not necessary. The parents should be taught in their clubs and civic organizations, so you do not need a lengthy permit slip."

Miss Shirley Vergeer, Clatsop County: "Too large a sheet of paper."

Miss Katherine Bisbee, Oregon City Schools: "I think that the requesting of the return of the slip even if the parent does not want the test is an improvement. I think the material in the explanation is too wordy."

Miss Mary Ellen Bell, Jackson County: "This request slip is good. However, in dealing with all types of parents we feel that the very simple slip is by far the best. There is no chance for doubt to arise - nothing negative. I believe it is wise to use the pamphlet 'The Tuberculin Test' with the request slip."

Mrs. Blanch Frisbie, Jackson County: "Consent slips must be very simple. They should have a positive tone, not suggesting anything that might ring of a negative picture - such as a harmless test; some aren't harmless in their reaction, some children have very sore arms. Why suggest scar?"

Mrs. Edna Farris, Malheur County: "Because we are asking the parents to sign for all services given in the schools on one consent slip, a bulletin is sent out explaining all services."

Miss Erma Plett, Marion County: "Do you feel that telling them that if there is no reaction, the child does not have tuberculosis, is inclined to make people less conscientious about returning to have the test read? Parents should not be offered the chance to object. They will do it if they really object anyway, and the suggestion need not be made by the blank to check if they do not want the test."

Mrs. Winifred Fullington, Deschutes County: "I rather feel that by mentioning the 'seal sale' we again call attention to the people that some of their Christmas Seal dollar at least is coming back to them. It means a lot to the people over here some way."

Miss Lucille H. Vale, Sherman County: "But I feel that our slip could be improved by having the slip returned marked either yes or no."

Mrs. Bessie Woodmansee, Milwaukie City Schools: "We have used the same method in consent slips before, not only for tuberculosis but for immunizations. We do get a higher number of 'consents' because we can be sure all slips have been taken home."

Mrs. Bess Wells, Tillamook County: "We have found one direct statement makes less paper handling for the teachers and evidently less mental strain on some parents as to making decisions. We also charge a nominal fee for

the reason that it creates a little more responsibility. The general public have had so much handed to them in the past few years that many who had any pride have lost it."

Miss Ethel Ivy Gunderson, Clatsop County: "I like the idea of having a space for refusal. My reason for checking 'no' is due to the omission of name of child, grade, address, and birth date."

Of particular interest is the fact that only five of the nurses made comments objecting to the use of provisions whereby the parent can object to his child's being given the test. Ten of the nurses made specific comments of approval regarding the use of a provision for the parent to object to his child's being given the test. The advantages of a negative response are that it necessitates a return of the slip and it shows which parents need further education. The return of the slip with either consent or refusal with the proper administration to see that all slips are returned should elicit a greater response for the tuberculin test.

Some Features of Consent Slips Now Used in Oregon

Copies of consent slips used in 32 counties were returned in answer to one of the requests of the questionnaire. Sherman and Wasco counties have a joint Public Health Department and use the same form of consent slip. In all, 31 different forms were received.

These forms vary in size from a slip of paper only two and one half inches to a regular sheet of paper. Most of the slips are mimeographed (only nine printed).

Four of the request slips indicated that a charge is made as follows:

Douglas County	10¢
Tillamook County	10¢
City of Portland Health Bureau . .	25¢
Wasco and Sherman County	10¢

Four slips asked for the consent of the parents for other testing and immunization in addition to the tuberculin test as follows:

Douglas County:	
Diphtheria immunization.	30¢
Schick test.	20¢
Vaccination.	20¢
Tuberculin test.	10¢

Morrow County:	
Schick test.	15¢
Diphtheria immunization.	25¢
Smallpox vaccination	15¢
Tuberculin test.	No charge

Umatilla County:	
Schick test.	No charge
Diphtheria immunization . . .	" "
Smallpox vaccination . . .	" "
Tuberculin test.	" "

Harney County:	
Schick test.	No charge
Diphtheria immunization. .	" "
Tuberculin test.	" "
Health examination	" "
Smallpox vaccination . . .	" "

Some Affirmative Responses to Question No. 2

The following comments were made by nurses who agree to the conclusion that, "Although some value may be attached to tuberculin testing of grade school children, the testing of high school students is of more significance and of greater value to the diagnosis and control program:

Miss Lucille H. Vale, Sherman County: "Definitely so - especially in the senior year."

Mrs. Winifred Fullington, Deschutes County: "It is suggested that we confine our testing to pre-school and high school groups except in cases of known contact in the family."

Mrs. Helenmarr Hammer, Deschutes: "We have found that the per cent of reactors in our high school groups has not been greater, but that the individual cases have proved to be more valuable as a diagnostic aid. We did a total of 1,233 tests last April (1941) 803 grade school with 9 positive, 386 high school with 8 positive, 19 pre-school, no positive, and 25 adults with 3 positive reactions.

Miss Shirley Vergeer, Clatsop County: "Testing of first graders may disclose sources of infection outside because of limited surroundings."

Mrs. Irene C. Sanders, Linn County: "The above statement has been found to be correct by the study of results of numerous testing programs carried on throughout the entire country."

Mrs. Ethel Littler, Coos County: "Checking high school students is valuable in diagnosis. Checking pre-school and first graders is valuable in control and tracing sources."

Miss Ellen Stadius, Klamath County: "During the past two years this health department has limited its group testing of grade school children to the first grade. We feel that this is an important group to reach but that it is more important to test high school students."

Miss Virginia Pierson, Baker County: "This has been distinctly proven in Baker County in studies made last year."

Mrs. Bertha Griffith, Harney County: "I find that the first grade is a vulnerable point for T.B. tests, if that child has not been tested as a pre-school child and very few are. Statistics show more active T.B. among young adults. If it can be picked up during the childhood infectious stage, more can be done in education of the parents and child toward better living habits."

Miss Lucy Davison, Wasco County: "Yes, and contacts of other schools ages."

Miss Florence Weisser, Clackamas: "Our health officer maintains same statement in that our staff is not adequate to the extent of an intensive T.B. skin testing program's being carried on throughout our county so the high school should be tested first at least as they are in more danger of immediate infection."

Mrs. Myrtle H. Caldwell, Klamath: "However, I do think that by testing first graders the source of infection can more easily be determined."

Mrs. Lela Elrod, Coos County: "In 1941 Coos found one childhood T.B. and one active Pul. T. B. in parent of positive reactor. I know high school should unearth more cases, but I hesitate to wait until child reaches high school before offering test for first time."

Miss Helen Marcy, Lake County: "Yes; I definitely agree with this statement and would add to it the testing of adults who are out of school as being important in the diagnosis and control of tuberculosis."

In addition to the above comments by the county health nurses, the following comment was received from Doctor Herbert Notkin of Benton County: "I do not think there could be any doubt as to the truth of the above statement except that it probably puts a little too much emphasis on the tuberculin testing of grade school children."

Some Negative Responses to Question No. 2

The following comments were made by the nurses who checked that they disagree to the conclusion that "Although some value may be attached to tuberculin testing of grade school children, the testing of high school students is of most significance and of greater value to the diagnosis and control program":

Miss Mary S. Cowell, Multnomah County: "If a child is found to have a positive tuberculin in grade school, I believe a better follow-up may be made and a greater knowledge by the family as to significance of a positive reaction and care of youngster would possibly cut down our 'active pul. T.B.' cases in teen-age group."

"I believe our attention should be given to a more intensified program of education to all groups of ages, including P.T.A., Grange, lodges, and in normal schools with a greater stress on type of materials used in education by our public school systems. I believe education should play a great part in our control of tuberculosis."

Another comment by a Multnomah county nurse who didn't give her name: "Examination of high school age will find a few cases but it is of very little value in finding sources of infections. Pre-school or lower grade children because of restricted contact are a better group for control of infection."

Miss Shirley Leppere, Marion County: "Tuberculin testing of grade school children is educational. Though no contacts may be picked up in the majority of cases, there is always the possibility. In one school (grades 1-6) with a population 196, 24 students were positive. Two direct contacts were picked up."

Miss Shirley Christiansen, Eugene Public Schools: "I believe that all first grade pupils and new pupils in the school should be tested in addition to the high school group. Verification of this was found among pupils tested this year in my division of the Eugene Public Schools. Of 13 positive reactors, 9 were new pupils. Two of these had definite lesions of arrested tuberculosis."

Mrs. Helen M. Moorelock, Lane County: "More reactions are found."

Miss Helen Smith, Multnomah County: "We feel that the tuberculin test is helpful in the pre-school group in finding contacts; however, high school students should be examined for the disease by means of fluoroscope or X-ray. Contacts are difficult to find in this age group."

Miss Mabel Kirschman of Lane County signified that she both agreed and disagreed by stating: "To discover contacts and develop health habits early in life that would prevent breakdown, I would certainly urge giving

the test early in life. As far as finding active cases of tuberculosis, certainly the high school age is more in need of testing. Could reactions have been found earlier? (Had you known that our University has been unable to give X-rays to their freshmen and sophomore positive reactors this year?)"

Miss Beatrice Turtle, Lane County: "The grade school children will be fewer in number but if you wait until high school, maybe he has already developed tuberculosis, whereas if he were tested in grade school and follow-up contacts tested and child removed from source of infection, he may not develop tuberculosis in the high school age."

Miss Jessie Diehl, Lincoln County: "We have sent five school children to sanatoriums this past year and know of several more cases. One high school pupil was hospitalized. The age group (of greatest incidence) is in upper level, 24-70."

Mrs. Bessie Woodmansee, Clackamas County: "We find very few positives in grammar school, but I feel that it is a very good way of finding active T.B. cases in the homes of positive reactors."

CHAPTER IV

SUMMARY AND CONCLUSIONS

For over a quarter of a century The National Tuberculosis Association and its affiliated state and county associations have been very active in school health programs. These associations have been pioneers and leaders in both specific tuberculosis control and in the broad field of health education.

During recent years (since about 1930) much attention has been centered on tuberculosis control and prevention by modern methods of testing and the use of the X-ray in large groups of grade school, high school, and college students. In addition to being of value from a case finding standpoint, these testing programs have done much in the way of practical education.

A review of the larger testing programs conducted in schools throughout the country and opinions of several authorities point out that more emphasis should be placed on the testing of high school students than on the testing of grade school students. This study found that such a contention is upheld by 64 out of 75 county health nurses in Oregon. However, in actual practice more tests are given in the Oregon grade schools than in the high schools. Figured on a percentage basis of students, the

trend in recent years has been to test a little over nine per cent of the grade school students and a little under nine per cent of the high school students. These figures should be slightly modified because they do not take into consideration that some high school students are not tested because they had reactions in grade school (It is not necessary to repeat a test on a positive reactor). It is one of the conclusions of this study that more emphasis should be placed on the tuberculin testing of high school students.

This study recommends a testing program that would place emphasis on the Mantoux test in the first grade; on students from homes of known contacts; the testing of high school and college students upon entrance, the re-testing of negative reactors; and the annual X-raying of all positive reactors.

There should be close cooperation of the school with the family physician, school physician, and public health officials in restricted programs and supervision of students who are continuing in school with arrested (non-communicable) forms of the disease.

Tuberculin testing should be integrated with school health education; the actual testing should be preceded by careful education of both parent and student.

A well worded and carefully administered parents' request slip is a vital factor in the success of a tuberculin-testing program. Such programs might not include a very high per cent of the students due to faulty administration on checking the return of request slips from the homes. Opinions of several county health nurses support the contention of this study that a consent or request slip which includes a provision for the parent to either give or refuse permission to have the child tested and a close check by the home room teacher to see that each child returns the slip, will elicit a higher number of requests.

If some parents fail to give their consent, this information will be of value to the health and education authorities. It will, for instance, point out to the nurse specific homes that need more education. She may even find that some parents refuse to have the test given to the child through fear that the child may be found to have actually contracted the disease from contacts within the family.

Due to the following conditions a uniform consent slip for all Oregon schools is not practical:

1. Some schools make charges for testing
2. Some schools elicit the parents request for the Schick test, diphtheria immunization, and smallpox vaccination on the same form.

3. Wide differences in the amount of education of parents prior to the giving of the test dictates that some request slips need little information of an educational nature, while others should contain detailed information of an educational nature.

4. Some counties use the request slip for record-keeping and need certain identifying data and other information on the form that would vary from that needed in other counties.

Due to the high incidence of tuberculosis in school teachers, the 43 states not having state laws requiring the examination of all teachers for tuberculosis should enact legislation to the effect that all school employees submit evidence that they are free from communicable tuberculosis.

The study of Lumsden, Dearing, and Brown contending that tuberculin skin testing with any of the tuberculin preparations on the market (in 1939) is of questionable value or definitely futile in showing the true incidence of tuberculosis infection in the general population should not cause a curtailment of the testing in the schools. Their study does point to the importance of the quantity and quality of tuberculin used in a testing program.

Integration of all phases of school health education in the control and prevention of tuberculosis should be

secured. Proper health habits that will aid in the control and prevention of tuberculosis are doubly important because they are also applicable to the prevention of other diseases.

Although this study has placed emphasis on the tuberculin test and school health education, the view that social sciences, physical sciences, and other parts of the curriculum should play an integral part in the formation of sound health habits that will aid in the control and prevention of tuberculosis is highly legitimate.

In conclusion, the following statement supported by 64 out of a total of 75 county health nurses of Oregon answering a questionnaire is stated because of its important implication in light of the actual testing being done in Oregon schools: Although some value may be attached to tuberculin testing of grade school children, the testing of high school students is of more significance and of greater value to the diagnosis and control program. This conclusion does not dictate the curtailment of testing first graders. Many contacts in the home have been traced through younger children with positive reactions. In fact, where funds and facilities are available, testing throughout the grades is of value from an educational standpoint. However, the higher incidence of tuberculosis and the lack of well organized testing programs in high school point to a need of emphasis in the testing on the secondary level.

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APPENDIX A
CORRESPONDENCE

3105 Jackson Street
Corvallis, Oregon
January 10, 1942

Mr. Carl E. Hopkins
Oregon Tuberculosis Association
605 Woodlark Building
Portland, Oregon

Dear Mr. Hopkins:

Upon your suggestion, I called on Miss Brenenstal at the Oregon State Board of Health. She was very helpful and gave me a summary report of the Tuberculin testing in Oregon from 1934 to 1937 and a copy of the report for 1939. She will let me have a copy of the report for 1941 when it is available next month.

From a study of these reports together with some other reading and a few interviews, I am wondering if the Tuberculin testing program in our schools cannot be made more effective. The reports Miss Brenenstal gave me show that far more testing is done in the preschool and grade school groups than is done in the high schools and little or no testing is done in the Portland schools.

I have figured out some percentages from the 1939 report and find the following:

	<u>Preschool</u>	<u>Grade 1</u>	<u>Grade 2-8</u>	<u>High School</u>
Number tested:	599	989	12,617	5,624
Positive reactions:	44	72	774	580
Per cent positive:	7.5	7.2	5.1	11.7

The above figures show that over twice as many tests were given in grades 2-8 as were given in high school. They also show that the per cent of positive reactions in high school was over double the per cent of positive reactions in grades 2-8. The test has greater educational value in high school because the students are older and understand it better.

Mr. Carl E. Hopkins

Now I want to ask you, Mr. Hopkins, if I am correct in my contention that more emphasis should be placed on the testing program in high school? Also, would it be a good idea to place emphasis on the test in the first grade rather than on the preschool group because it is not an easy matter to round up the preschool children?

Enclosed you will find my first draft of a "Uniform Consent Slip". No doubt it can be improved. The aim of the consent slip would be both educational or an attempt to increase the number of tests given to certain age groups. I believe a consent slip of this nature would enlarge the testing where needed; so many children fail to bring permission from home under the present method. By using the consent slip and having the teachers check to see that they are all returned, I am sure the test will be taken by a great many students that have never been tested. Will you please let me have your opinion on this enclosed consent slip?

Will you please send me a copy of No. 5 of the Administrative Series: "The Place of Child Health in a Tuberculosis Program"?

Also, Miss Brenenstal mentioned that you might be able to let me use the "Tenth Annual Report of the Tuberculosis Committee of American Student Health Association, 1930-1940". I believe it is a reprint from Journal Lancet, April 1941.

When I have gone further in my work, I will check it with you and I do hope I can do a piece of work that can be of some practical value.

Sincerely,

James A. Carr

OREGON TUBERCULOSIS ASSOCIATION
605 Woodlark Building
Portland, Oregon

January 13, 1942

Mr. James A. Carr
3105 Jackson Street
Corvallis, Oregon

Dear Sir:

Your interesting letter raises a good many questions, for many of which the answers are not yet certain. I see, however, that you have made considerable headway in your own appreciation of the problems involved, and I will attempt to answer some of the questions you have raised.

Paragraph two raises, I believe, questions that are somewhat outside the field of public health and epidemiology. It seems to be true of most social and political organizations, that practice lags behind our technical knowledge. When tuberculin testing as a means of discovering presumptive tuberculosis cases was first introduced in Oregon, a long and slow process of education of the people was required before it gained general acceptance. At that time, it was entirely reasonable to test all the school grades, since they had not been previously tested and the presumption was that the incidence of tuberculosis would be fairly high throughout the whole population. As this program of mass testing in the schools (the place where it was easiest to get mass consent) continued year after year, and the positive reactors and active cases were brought under supervision, the incidence of disease among this population of course decreased, so that we now find very few positive reactors, and even fewer active cases in the school testing programs. We find, however, that our work of educating the population up to acceptance of tuberculin testing has been so effective that the people now resist efforts to withdraw routine testing from any of the traditional (school) groups. I believe the reason why the tuberculin testing program in general is not more effective is that the community, including the technical personnel, are lagging somewhat behind the implications of these new developments.

Mr. James A. Carr

The question of why tuberculin testing is not done in Portland schools is, I believe, an administrative matter. May I suggest that you consult with Dr. Nabelung on this.

The very purpose of the tuberculin testing summary reports that Miss Brennenstall showed you was to give us a basis for evaluating the tuberculin testing program in the counties of Oregon. The results, as you have already pointed out, certainly justify the contention that from a case-finding standpoint, it is not very profitable to be testing grade school children and that more emphasis should be placed on the testing of high school children and adults. As for testing grade one and preschool children, it does not make much real difference from a case-finding standpoint when they are tested. It has been somewhat easier from an administrative standpoint to test the children entering grade one. On the other hand, a community that had a completely functioning maternal and child health program would probably have tested most of its children before they entered school. I would say that it would be unsatisfactory to make any arbitrary recommendation on this, other than that every child should be properly immunized and examined and tested some time before he is mixed in with numbers of other children in the first grade of school.

You also raise the question of the educational value of the tuberculin test. It used to be argued by some that even if the tuberculin test was useless as a case-finding technique, it still had distinct value as health education. I personally question this contention. There is abundant recent evidence to support my views. May I suggest that you read some of the articles on tuberculin testing and case-finding appearing in the recent issues of the American Review of Tuberculosis. Also useful would be the report of the City of Chicago Tuberculosis Sanitarium, Vol. 18-20, 1940, which is a detailed report of a three-year program of testing school children in Chicago schools - 167,000 children tested, 23,000 X-rayed.

I should probably amplify the above statement. The tuberculin test in itself is probably of very little educational value. It may, however, be woven into a sound health education program, sometimes is. Its primary importance, however, is as a screen for sorting out the population and finding presumptive cases.

Mr. James A. Carr

Again, I do not have very much confidence in the consent slip by itself. If there has been a good education program leading up to the tuberculin survey, almost any slip will obtain the desired consent. Without the proper educational build-up, almost any slip will fail to get consent. I think, however, that a detailed study of how the consent slip actually worked in practice might lead to removal of some of the technical bugs that are causing some difficulty at present.

Some comments on your drafted consent slip:

1. If the slip is going to do some education, I think it will have to do a little more than you have attempted. I think it needs to show the parent exactly what the test will mean to this particular child in terms of health protection, etc.

2. Again on the consent slip you want not the cooperation of parents in general but the cooperation of this particular parent. Make it more personal (the assumption is that your educational program has already obtained the cooperation of parents in general).

3. I have an idea the word "consent" starts you off on the wrong foot. People usually think of consent as being a reluctant submission to something not desired. Would not it be preferable to call it a "request" slip, so as to put the parent in the position of requesting something of value? I also question the desirability of suggesting on your form that anyone might want to object to the test.

I am enclosing a copy of the literature you requested.

May I urge you again to delimit your field of study by sharpening your thesis questions, and get some of the actual experience of health officers, nurses, teachers.

I wish also to assure you that your interest in this subject is timely and very much appreciated, and that you will certainly find tuberculosis workers everywhere more than willing to help you.

Very truly yours,

Carl E. Hopkins
Statistician

3105 Jackson Street
Corvallis, Oregon
January 13, 1942

Miss Jeane Gallien
Visiting Nurses' Association
1008 S. W. 6th Avenue
Portland, Oregon

Dear Miss Gallien:

I am returning your copy of "Appraisal Form for Local Tuberculosis Activities". Thank you for letting me use it; I am including parts of it in my thesis on "The School as an Aid in the Control and Prevention of Tuberculosis".

If I may, I would like to keep your copies of "The Bulletin" for a while and return them later. They are being a real help to me.

Miss Brenenstal of the Oregon State Board of Health was very helpful and gave me a report on the Tuberculin test program in Oregon from 1934 to 1937 and a copy of the report for 1939. She will let me have a copy of the report for 1941 when it is available next month and a copy of the report on the tests given to the school teachers.

From the 1939 report, I have figured some percentages and find the following:

	<u>Preschool</u>	<u>Grade 1</u>	<u>Grades 2-8</u>	<u>High School</u>
Number tested:	599	989	12,617	5,624
Positive reactions:	44	72	774	580
Per cent positive	7.5	7.2	5.1	11.7

The figures show that less than half as many tests are given in high school as are given in grades 2-8 in spite of the fact that the percentage of positive reactions in the high school group is more than double the percentage of positive reactions in the grade 2-8 group. Don't you think there is room for a better testing program in our high schools? The test isn't given in our Portland high schools at the present, but the 1934-1937 report shows the children of Multnomah County taking the test showed a percentage of 16.3 positive reactions against a state-wide school average of only 5.3 per cent.

Miss Jean Gallien

I am enclosing two copies of my first draft of a "Uniform Consent Slip". I am also sending a copy to Mr. Carl Hopkins of the Oregon Tuberculosis Association. Will you please give one of your copies to Miss Crowe? I am anxious to hear some opinions from you and Miss Crowe and Mr. Hopkins, relative to this consent slip.

It is my opinion that by having the classroom teachers check carefully that all children of the groups that are desired to be tested return a consent slip there will be more students taking the test. Under the present setup the test misses a number of children because they do not bring consent from home and without this consent the test is not given to them.

I will be greatly thankful for any suggestions you and Miss Crowe can make and your calling my attention to any material that I should read or include in my thesis. Thank you for the help you have given me so far, and I will check with you from time to time on the work I am doing.

Yours sincerely,

James A. Carr

THE VISITING NURSE ASSOCIATION
1008 Southwest Sixth Avenue
Portland, Oregon

February 6, 1942

Mr. James A. Carr
3105 Jackson Street
Corvallis, Oregon

Dear Mr. Carr:

I am sorry that there has been some delay in answering your letter.

We were very much interested in the copy of the Consent Slip. I got the opinions of Dr. Speros and a County Health Officer regarding this. Dr. Speros suggests that the order of sentences be rearranged as you will note on the copy I am returning to you.

The other doctor prefers a shorter form with only the positive statement: "I herewith request that my child be given the tuberculin test". He arranges for educational talks to the parents in advance.

The statistics you obtained are a good help, but other Oregon counties and Multnomah County, excluding Portland, give you more of a picture of the rural situation.

I hear that Portland University School of Nursing will have some figures soon as they have completed the testing. That is the age group when the incidences of positive reactors will be greater.

Two pieces of literature which may be of assistance to you are: A pamphlet entitled "Programme for an Intensive Community Campaign Against Tuberculosis" and a book by Dr. Heatherington, M.D. and Miss Fannie Eshlemen, R.N. on "Nursing in Prevention and Control of Tuberculosis".

These two people are with Henry Phipps Institute, and that institution is considered one of the best authorities on this subject today.

Mr. James A. Carr

Miss Crowe joins me in wishing you success in this undertaking. It is good to know that more of the Educators are interested and aiding us in this campaign.

We are certain that all help of this kind is of much value.

Very truly yours,

Jeanne Gallien R.N.
Tuberculosis Supervisor

Reply to County Health Nurses

3105 Jackson Street
Corvallis, Oregon
April 21, 1942

Thank you very much for answering the questionnaire relative to my thesis on "The School as an Aid in the Control and Prevention of Tuberculosis".

The total response was highly gratifying. Questionnaires were mailed to 93 nurses and elicited a response from 79 nurses in 33 counties. This was a response of almost 85% without a follow-up letter.

Forty-seven nurses said the suggested "Parents' Request Slip for Tuberculin Test" is an improvement on the one last used in their locality. Thirty-two nurses were of the opinion that it is not an improvement. The need for more identifying information relative to the name of student, address, school, age, family physician, date of test, result of last tuberculin test, etc., shows that the request slip is used for record keeping in a number of localities.

Considerable interest was shown regarding the provision for the parent to refuse the test if he so desired. Six nurses made specific comments to the effect that it would not be a good idea from a standpoint of psychology. However, ten nurses made comments to the effect that a space for the parent to refuse is a good idea in that:

1. It may show where some specific education is needed in pointing out parents that do not really understand the test.
2. Provisions for the parent to either accept or reject the test and administrative procedure to see that all students return a request slip will elicit a higher return than has been received in the past.

One nurse commented: "Our trouble is with the high school students who are so engrossed with other things that they fail to take the slip home."

It is my opinion that very few parents will object to the test. Provision for the parent to either accept or reject will aid in the administration of checking the return of the request slips. Slips used in two counties make provision for the parent to either accept or reject the test. These two counties find this method highly satisfactory. Other counties may be interested in trying out such a provision.

In answer to the question relative to the following conclusion: "Although some value may be attached to the tuberculin testing of grade school children, the testing of high school students is of more significance and of greater value to the diagnosis and control program", the following opinion was expressed:

Sixty-six nurses agreed to the conclusion.
 Eleven nurses disagreed.
 One nurse marked in both squares.
 One nurse gave no opinion.

The following data are condensed from the 1939 report of the tuberculin testing program in Oregon schools:

	Pre- school	Grade 1	Grades 2-8	High School
Number Tested	599	989	12,617	5,624
Positive	44	72	774	580
Per cent Positive	7.5	7.2	5.1	11.7

I believe the above figures indicate that there is a need for more emphasis on the tuberculin testing program in the high school. Figured on a percentage basis the test was given to 9.5% of the grade school students and to only 8.9% in the high school. Of course, the fact that the test is not repeated on high school students who re-acted in grade school will make a slight modification in the above figures.

Thank you again for your splendid cooperation,

Yours sincerely,

James A. Carr

APPENDIX B

GRAPHS

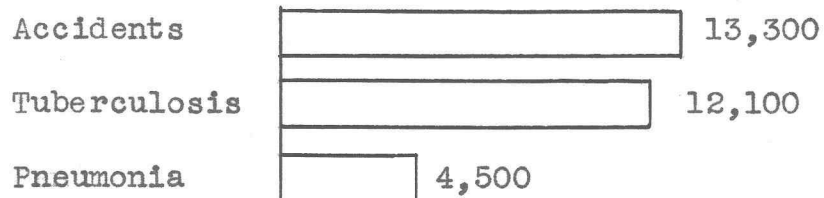
THE DECLINING TUBERCULOSIS DEATH RATE
1910-40



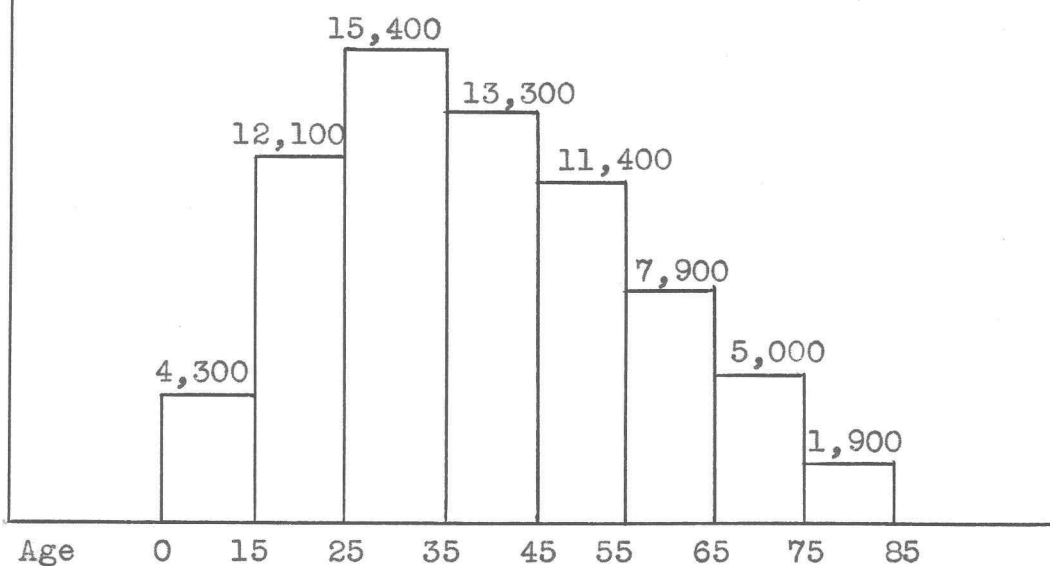
*Data for 1939 and 1940 are tentative

Source: National Tuberculosis Association
and State Board of Health of Oregon

LEADING CAUSES OF DEATH
Ages 15 to 25 years
1934



NUMBER OF DEATHS FROM TUBERCULOSIS



Source: Metropolitan Life Insurance Company