



1933

The Saranac Laboratory
for the
Study of Tuberculosis
OF THE EDWARD L. TRUDEAU FOUNDATION

REPORT OF DIRECTOR
AND
FINANCIAL REPORT

FOR THE YEAR ENDING SEPTEMBER 30, 1933

REPRINTS OF SCIENTIFIC PAPERS

The Saranac Lake Academy of Medicine



THE SARANAC LABORATORY FOR
THE STUDY OF TUBERCULOSIS
OF THE
EDWARD L. TRUDEAU FOUNDATION

Leroy U. Gardner, M.D.	Director and Pathologist
Thomas M. Durkan, M.E.	Assistant Chemist
Winfield O. Kelley, B.A.	Clinical Pathologist
Douglas S. McCrum, B.S. (E.E.)	Photographer
Morris Dworski, C.P.H.	Assistant in Experimental Pathology
Catherine M. Cummings	Librarian and Secretary
Roy Dayton	Financial Secretary
James V. Luttrell	Purchasing Agent and Technician
George Hulpritt	Technician
Anthony Delahant	Technician
Andrew J. Redlin	Voluntary Assistant in Chemistry
Everett L. More	Voluntary Technical Assistant
William LaBounty	Assistant
Henry C. Stout	Assistant

FIELD AND CONSULTING STAFF

Donald E. Cummings, B.S.	Assistant Director in Charge of Field Work
Homer L. Sampson	Consulting Roentgenologist
Daniel M. Brumfiel, M.D.	Clinical Consultant
Robert N. Downs	X-Ray Supervisor
Richard Libbey	X-Ray Technician
Richard Walters	X-Ray Technician
Dorothy P. Rogers	X-Ray Stenographer

FOR
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ATION

Director and Pathologist
 --- Assistant Chemist
 --- Clinical Pathologist
 --- Photographer
 Experimental Pathology
 Librarian and Secretary
 --- Financial Secretary
 g Agent and Technician
 --- Technician
 --- Technician
 Assistant in Chemistry
 Technical Assistant
 --- Assistant
 --- Assistant

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in Charge of Field Work
 Consulting Roentgenologist
 --- Clinical Consultant
 --- X-Ray Supervisor
 --- X-Ray Technician
 --- X-Ray Technician
 --- X-Ray Stenographer

Report of the Director

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✓ The Pathologic Reaction in Various Pneumoconioses
 LEROY U. GARDNER

Experimental Inhalation of Bituminous Coal Dust and Its Effects Upon
 Primary Tuberculous Infection in Guinea Pigs
 LEROY U. GARDNER, DONALD E. CUMMINGS and GERALD R. DOWD

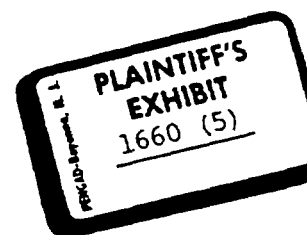
The Reaction to Fine and Medium Sized Quartz and Aluminum Oxide
 Particles — Silicotic Cirrhosis of the Liver
 LEROY U. GARDNER and DONALD E. CUMMINGS

Pathology of So-Called Acute Silicosis
 LEROY U. GARDNER

Silicosis and Its Relationship to Tuberculosis
 LEROY U. GARDNER

A Study of Tuberculous Infection by Way of the Female Genital Tract:
 A Supplementary Report
 EDWIN M. JAMESON

The Heart and Tuberculosis: Mediastinal Distortion as a Source of
 Circulatory Embarrassment
 DANIEL M. BRUMFIEL



THE SARANAC LABORATORY

The fact that the Saranac Laboratory has always been a separate institution from the Research and Clinical Laboratory of the Trudeau Sanatorium is not generally understood. Both laboratories are sponsored and controlled by the Trudeau Foundation, but the Saranac Laboratory is located at 7 Church Street in the village of Saranac Lake and not at the Sanatorium.

The properties of the Saranac Laboratory consist of the original building given to Dr. E. L. Trudeau by Mr. George C. Cooper in 1894 as a private research laboratory, together with the John Black Room, an addition which houses the medical library and lecture room, and special buildings for animals.

While the Saranac Laboratory co-operates with the Sanatorium in every possible way and serves as the headquarters for the Trudeau School of Tuberculosis, it provides diagnostic facilities to the physicians practicing in the village and carries on independent researches in the field of tuberculosis and associated conditions.

To avoid the existing confusion, the Trudeau Foundation is publishing an annual report of the Saranac Laboratory under separate cover from that of the Sanatorium.

REPORT OF THE DIRECTOR OF THE SARANAC LABORATORY - FOR THE STUDY OF TUBERCULOSIS

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LEROY U. GARDNER, M.D.

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It is a pleasure to announce the consummation of the plan suggested in the Director's report of last year whereby the Saranac Laboratory is enabled to undertake a comprehensive experimental, clinical, epidemiological, and engineering investigation of pneumonokoniosis as a causative factor in the production of tuberculosis. This most desirable approach to the problem should advance our knowledge more effectively than by attacking it along any single avenue of approach. Clinical study of disease as it develops under industrial conditions is obviously essential to point out the medical problems involved, but since many of these problems are concerned not only with the individual but with groups and families, epidemiological methods must also be employed. The engineering aspects of the subject are essential to comprehend and alleviate dust hazards which may be discovered and furthermore they are fundamental to define the etiology of a disease like pneumonokoniosis. With a knowledge of all these factors at our command, animal experiments can be planned to interpret the principles involved in a more intelligent manner.

Such a program of investigation has been made possible by the establishment of an intimate association between the Laboratory, the x-ray department of Trudeau Sanatorium, and the Saranac Lake specialists practicing in the field of chest diseases. Not only will this combination of resources permit a more comprehensive scientific investigation but it allows us to offer industry a consulting service for the detection of possible hazards from dust, for the proper examination of its employees, for recommendations to improve working conditions where these are necessary and for the treatment of any employees who may be found to suffer from occupational disease.

Mr. Cummings, the assistant director of the Laboratory, is supervising the work in the field. He will train engineers already employed by the industries in the technique of making atmospheric dust determinations; he will have supervision over ventilation, over clinical laboratory work in the field, and will co-ordinate the activities of all parts of a study. He is assisted by Mr. Robert N. Downs, a former associate of Mr. Sampson in the x-ray department, who is now in charge of all roentgenological examinations. Under their direction are technicians also trained by Mr. Sampson. At the present time Mr. Richard Libby is already at work and Mr. Richard Walters will begin in the near future. Their excellent training will insure satisfactory films which will be sent to Mr. Sampson for interpretation. Where plant physicians are available we propose to secure their co-operation in making physical examinations; if no suitable local physician can be found Dr. D. M. Brumfiel of Saranac Lake will make them.



Simultaneously with this investigation in the field, a laboratory study of the particular dusts and their effect upon the normal and tuberculous animals will be undertaken. The final co-ordination of data from all of these sources should enable us to obtain a clearly defined picture of any given dust hazard.

As reported last year, a contract was made with Oglebay Norton and Company to carry out such a study in an iron mine which they operate. This work is now in progress, together with animal experiments using ore and rock dusts from the mine in question.

In the Spring we were approached by the United States Gypsum Company to make a survey of their plant and employees in Oakfield, N.Y. Their operations comprise mining, pulverizing and calcining gypsum dust together with the manufacture of gypsum plaster, wall board and various other products. A series of dust counts was made in representative parts of this plant; one hundred men employed for maximum periods of time in various departments were given physical and x-ray examinations, and three different animal experiments with gypsum dust were begun. We were able to demonstrate that in spite of rather heavy dust concentrations developed in certain parts of the plant, there were no significant changes produced by the inhalation of this dust during periods as long as twenty years. The animals also have thus far failed to exhibit serious reaction and there has been no effect upon tuberculous infection. The evidence thus accumulated corroborates the prevalent opinion that the inhalation of gypsum, or calcium sulphate, does not cause changes in the lungs which are deleterious to health, nor does it predispose to tuberculosis.

During the Fall the entire group of companies operating iron mines in the northern part of Michigan decided to employ the Laboratory to make a survey of all their mines. They desired to know whether iron mining involves any risk from dust inhalation and if so they wished to take measures to minimize this hazard. On November first a contract for \$30,000 annually, for a period of three years, was signed between the Laboratory and the following operators: The Cleveland Cliffs Iron Company, The Corrigan, McKinney Steel Company, Davidson Ore Mining Company, The M. A. Hanna Company, Agent, Inland Steel Company, Oglebay Norton and Company, Agents, Oliver Iron Mining Company, Pickands Mather and Company, Agents, and Republic Steel Corporation. The original contract with Oglebay Norton and Company is, of course, superseded by the new one to which they are party.

Under Mr. Cummings' direction this field investigation is already under way. Engineers are being trained to make dust determinations. Large numbers of roentgenograms made by the technical staff are being sent to Mr. Sampson for interpretation and a series of laboratory investigations of the action of mine dust has been started in Saranac Lake. It is as yet too early to venture an opinion as to the results of this study, but in time we will have all the necessary information to evaluate the effects of work in iron mines.

These contacts have permitted the Laboratory to proceed with its program of research which would otherwise have been seriously hampered by the lack of funds. Mr. Cummings will, of course, not be able to continue his work



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portions of it.

Research

The new dust house built last year is now operating at full capacity
with five dust inhalation experiments in progress, using pure silica, hematite,
gypsum, and various combinations of these substances. Nearly 500 guinea
pigs and a smaller number of rabbits and white rats are involved in these
experiments.

The chief problems now being investigated are the determination of the
maximum amount of silica which must be inhaled before progressive disease
develops; the determination of the minimum amount of silicosis which
predisposes to tuberculous infection; the effects of non-siliceous dusts inhaled
simultaneously with silica; the continuation of previous studies upon the
effect of particle size in the production of tissue reaction. A method for
recovery and measurement of all the extremely fine inhaled dust particles
in portions of the silicotic lung promises to yield valuable information.

The previously mentioned attempt to develop a rapid method for deter-
mining the dangerous characteristics of various kinds of dusts is still in prog-
ress. The immediate effects of different kinds of dust particles have been
determined but to be of significance these changes must be correlated with
the chronic effects produced after months or years have elapsed. Publication
must therefore be delayed.

Much additional experimental data has been accumulated on the relation-
ship between silicosis and tuberculous infection, but it has seemed advisable
to defer reporting these findings until they can be correlated with the con-
dition in human beings. In this connection the general problem of the
relationship between immunity and silicosis is receiving careful attention.

Some of the chemical problems which Mr. Cummings had started are
being continued, notably a study of the various forms of silica and alumina,
and the reaction which they produce in animal tissues. Much time is being
devoted to the determination of the type of dust found in the lungs of
persons dying with different forms of pneumokoniosis. During the year
material from thirty-six such cases has come to the Laboratory for examin-
ation. Chemical analysis is not an altogether satisfactory method for the
identification of inhaled dust. It is desirable to develop a petrographic tech-
nique that may be applied to the minute particles which gain access to the
pulmonary air spaces. It is hoped that the co-operation of some specialist
in this field may be secured for this purpose.

Aside from the major research, other problems are being studied by
various local physicians. Dr. Baldwin is investigating the occurrence of non-
pathogenic acid fast bacilli in various habitats. Dr. Kinghorn and Mr.
Dworski are continuing their work on vaccination against tuberculous
infection. Mr. Cummings and Mr. Delahant have nearly completed their
study of hypersensitiveness and immunity in tuberculosis. Dr. J. N. Hayes
has been testing the reactions of the lungs to various oils and is also studying
their relative effectiveness in the maintenance of oleothorax in the experi-
mental animal. Recently he has obtained a grant of \$200 from the E. R.

Squibb Company to investigate the effect of irradiated mineral oil on tuberculosis of the pleura. Mr. Winfield Kelley, in co-operation with the x-ray department of the Sanatorium, is attempting to produce pulmonary tuberculosis in cats and to follow the course of the infection roentgenographically. If this could be accomplished in a resistant animal like the cat it would prove a valuable tool in our studies, for silicosis has been reproduced in this animal which has very large lung fields that are easily visualized in roentgenograms. Dr. D. M. Brumbel is assisting in the study of several of the laboratory silicosis problems. Dr. E. M. Jameson is continuing his investigation of genito-urinary tuberculosis.

Teaching

There has been no change in this part of our program during the past year. We have participated in the instruction in the Nurses' Training School at the Sanatorium and in the Trudeau School of Tuberculosis. For the latter the course in Pathology was altered to correlate it more intimately with the roentgenological aspects of tuberculosis.

In the coming session of 1934 we hope to have several physicians from the mining companies for whom we are making the field study. If this plan materializes considerable time will be devoted to the pathology and x-ray appearance of pneumokoniosis.

Clinical Laboratory Work

The diagnostic department has been under the direction of Mr. Winfield O. Kelley since September when Dr. Schwartz left us to accept a position in the Sanatorium. He is assisted by Mr. Delahant. As will be seen in the appended summary, the total number of examinations fell below that for last year by 371. This is a reflection of the decrease in the number of the patients in the village rather than a lack of the use of the Laboratory facilities by the physicians. Much of this work has been done without cost, as many patients were unable to pay even a moderate fee. The contributions of \$2,010 received from the Academy of Medicine have been devoted to the support of this department. Mr. Kelley, who receives no salary but is dependent upon fees, is the recipient of a fellowship and spends part of his time in the Sanatorium.

Summary of Diagnostic Examinations November 1, 1932 to November 1, 1933

Cultures for diphtheria	16	Stomach contents	29
Smears for Vincent's angina	21	Sputum for tubercle bacillus	1451
Blood:		Milk, bacteriological counts	17
Agglutination for typhoid	10	Water, bacteriological examination	93
Differential counts	102	Water, chemical examination	365
Red and white counts	201	Smears for gonococcus	7
Hemoglobin determinations	89	Urine	920
Coagulation time	47	Autogenous vaccines	6
Grouping	78	Pathological specimens	129
Cultures	10	Autopsies, human	93
Chemistry	41	Animals inoculated for diagnosis	14
Spinal fluid, urine and other miscellaneous material for tubercle bacillus	81	Miscellaneous examinations	102
Grand total			3838

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Staff

Mr. Cummings' absence and the increased amount of work that will be undertaken will necessitate the employment of more full time members of the staff. An effort is being made to find a properly trained pathologist and bacteriologist to relieve the director of some of his responsibilities. Several prospective candidates are being considered. Mr. Thomas M. Durkan, a graduate of Cornell in mining engineering, has been serving as voluntary assistant in the chemistry department for eight months; he is now joining the regular staff as assistant chemist. We are fortunate to find a man with his training to devote to the laboratory phases of a problem such as ours. Mr. Winfield O. Kelley has taken over the direction of the diagnostic department and is also engaged in research here and at the Sanatorium.

The director takes this opportunity to express his appreciation to every member of the staff for their loyal co-operation during the year of reduced incomes and salaries. To Dr. Spencer Schwartz, who retired in September, everyone is grateful for his faithful though inadequately compensated services in the diagnostic department. Gratitude is expressed to three voluntary assistants, Miss Laura Ladd, Mr. Everett L. More and Mr. Andrew J. Redlin. Miss Ladd and Mr. More will not be with us during the coming year, but Mr. Redlin will continue as assistant in chemistry.

Great credit is due to Mr. Cummings for developing and organizing the field research activities, for without the income from this source very little of the Laboratory work could continue. It is regrettable that his own researches must be interrupted, but his engineering training particularly qualifies him for the type of work in which he is now engaged.

Buildings

Even at the present time the accommodations of the Laboratory are inadequate to carry on the work in progress, and for the proposed increase in the staff additional space becomes imperative. The logical place for expansion is above the John Black Room which was erected with this possibility in mind. It gives us very great pleasure to announce that Mr. and Mrs. Frank B. Black have most generously offered to provide the needed addition to the building. This further manifestation of their faith in the Saranac Laboratory is inspiring and gratifying. Plans are now under consideration and it is hoped that construction may be commenced in the Spring. For furnishing and equipping this addition the support of other friends will undoubtedly be secured. Mr. Henry Upham Harris has already given \$250 for this purpose.

Publications and Reports

In the field of pneumokoniosis seven papers have been delivered before various scientific organizations. Reprints of five of them that deal with original work are bound with this report. Material for study is being gathered from every possible source, both human and experimental animal. Whenever possible personal inspection of field conditions is being made. For example, the paper on "So-Called 'Acute' Silicosis" was written after studying all available data at the place where this condition was developed.

PLAINTIFF'S
EXHIBIT
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The two remaining reprints in this volume are by Dr. Brumfiel and Dr. Jameson respectively. The former deals with cardiac displacements in chronic tuberculosis and the latter is a report of further observations on experimental genital tuberculosis.

Finances

The accompanying financial statement for the past fiscal year shows a balance in the treasury. This was made possible by various economies and by the receipt of income that was not anticipated when the budget was prepared and the work for the year was planned. The extra income was derived from contributions to the Academy of Medicine, from the contract with the U. S. Gypsum Company and from a contribution of \$500 from "a group of friends". These friends are a number of industrialists in Milwaukee and the vicinity who, under the leadership of Mr. Benjamin E. Kuechle of the Employers Mutual Insurance Company, and Mr. Harold Falk, raised a fund to bring together a group of specialists to inform themselves about silicosis. This was the meeting mentioned in last year's report which Mr. Cummings and the director, among others, addressed in Chicago. After all expenses for this meeting had been paid an unexpended balance was turned over to the Laboratory for research purposes. We take this opportunity to thank them publicly for their help.

For the coming year an income of approximately \$42,000 is anticipated from various sources. Salaries have been raised at least to the same level as they were before the enforced reduction of last year and in some instances there have been further increases commensurate with the services rendered. One additional man has already been placed upon the payroll of the research staff and another will be employed some time during the year. Six new names appear on the payroll of field personnel and Mr. Cummings has been transferred from laboratory to field work.

The field expenses and moneys allocated to the x-ray department will amount to approximately \$16,500, leaving a balance to be expended in the Laboratory of about \$25,500. With the increases in salary that have been made this sum will hardly be adequate to carry on the full program of research that has been outlined. However, we have fairly good assurance that certain new sources of income will become available and that some of the older pledges on which we had not counted may be renewed. All receipts from the Academy of Medicine will be devoted to carrying the diagnostic department. The only contribution that will be asked of the Trudeau Foundation, whose income is depleted, will be a fellowship for the maintenance of the clinical diagnostician.

It is a pleasure to acknowledge our debt and sincere appreciation to all the friends who have so loyally supported the Laboratory during a trying period. The assistance of the many lay contributors to the Academy of Medicine is extremely gratifying. The contributions of one large donor, the Metropolitan Life Insurance Company, have been the mainstay of the experimental work during the past five years. To this company we are deeply grateful.

The outlook for the coming year is brighter, but we have greatly widened the scope of our work and it behooves us to be diligent in seeking out new sources of support. It is hoped that our activities may justify the trust that has been placed in us.

by Dr. Brumfiel and Dr.
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RECEIPTS AND EXPENDITURES

SARANAC LABORATORY FOR THE STUDY OF TUBERCULOSIS

1932 TO OCTOBER 1, 1932 TO SEPTEMBER 30, 1933

Receipts:

Balance on hand Oct. 1, 1932	\$2,853.70
From endowment held in trust by Trudeau Foundation:	
Interest on securities	\$2,450.00
Interest on cash balances	11.22
	<u>\$2,461.22</u>
Gifts for maintenance of work:	
Adirondack Fund for the	
Tuberculous	1,000.00
Anonymous (per Dr. Baldwin)	100.00
Eugene Musser Eckert Fellowship	1,000.00
"Group of Friends"	500.00
Metropolitan Life Insurance Co.	5,000.00
Milbank Memorial Fund	3,000.00
Miscellaneous donations	120.00
Oglebay Norton & Co.	3,750.03
Saranac Lake Academy of Medicine	2,010.00
U. S. Gypsum Company	2,375.00
U. S. Public Health Service	1,099.98
Total of gifts	<u>19,955.01</u>
From Trudeau Foundation	3,000.00
	<u>25,416.23</u>
Total Receipts (carried forward)	\$28,269.93

*See following pages for list of donors

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SARANAC LABORATORY FOR THE STUDY OF TUBERCULOSIS

OCTOBER 1, 1932 TO SEPTEMBER 30, 1933

Total Receipts (brought forward)	\$28,269.93
Disbursements:	
Salaries	\$17,452.48
Animals and feed	1,147.10
Supplies and equipment	1,232.40
Fuel	506.56
Gas	136.55
Light and power	335.45
Telephone	95.37
Laundry	81.94
Repairs	79.32
Library	544.99
Publications	258.55
Traveling expenses	271.82
Animal House:	
Building	92.22
Equipment	830.59
	922.81
Miscellaneous expenses and supplies	185.22
Contingent: extra supplies	
and equipment for new work	864.90
Total cost of work carried on	\$24,115.06
Donation returned to donor	500.00
Total disbursed	\$24,615.06
Balance on Hand Sept. 30, 1933	3,654.87

PLAINTIFF'S
EXHIBIT
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The Saranac Laboratory
for the

Study of Tuberculosis

THE EDWARD D. COLEMAN FOUNDATION

REPORT OF THE DIRECTOR

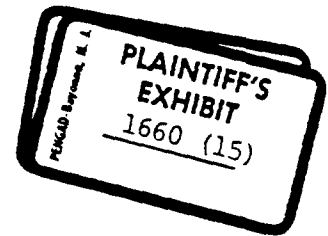
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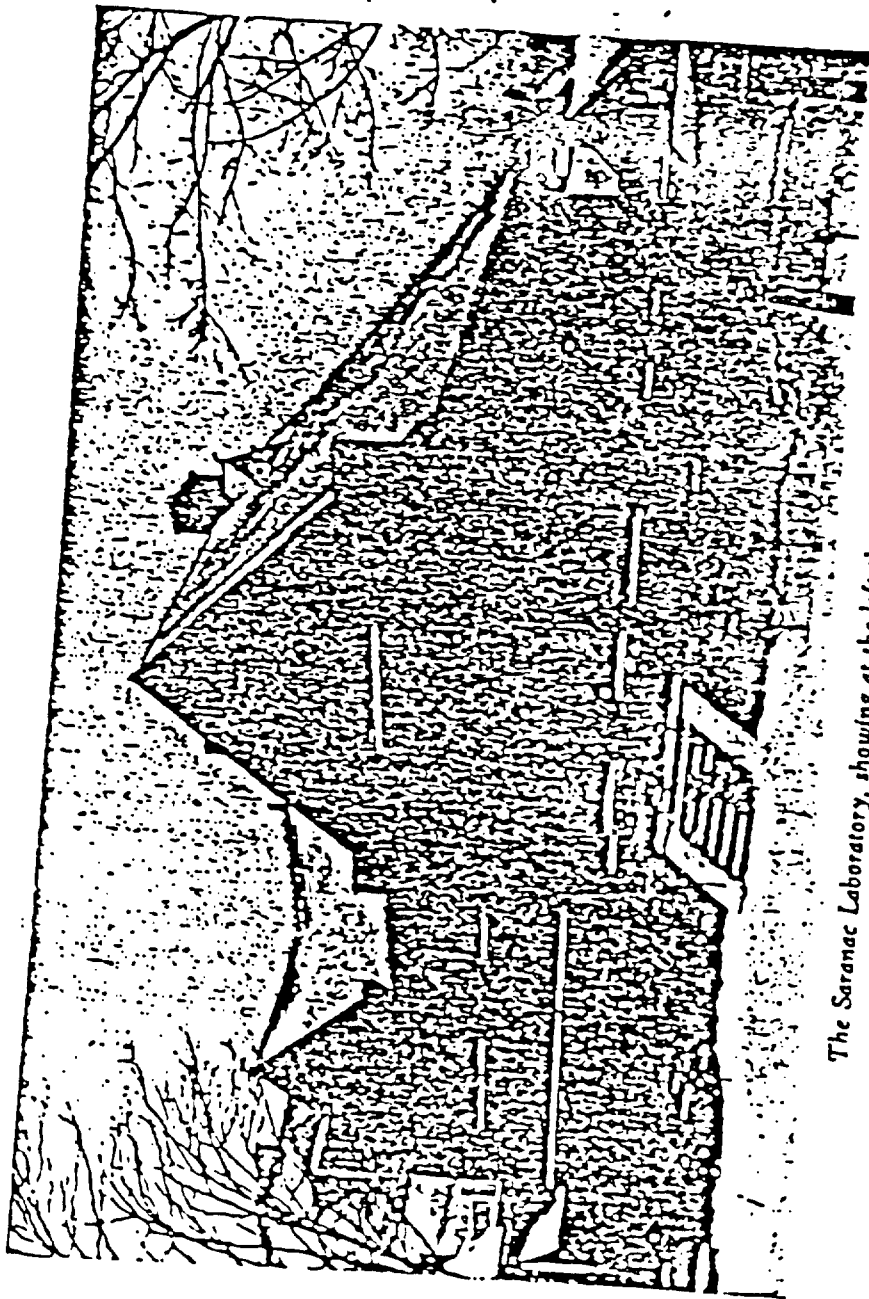
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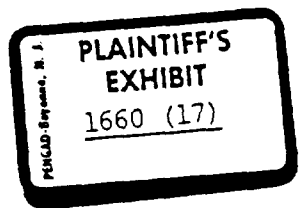
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PLAINTIFF'S
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The Saranac Laboratory, showing at the left the new John Black Wing



THE SARANAC LABORATORY

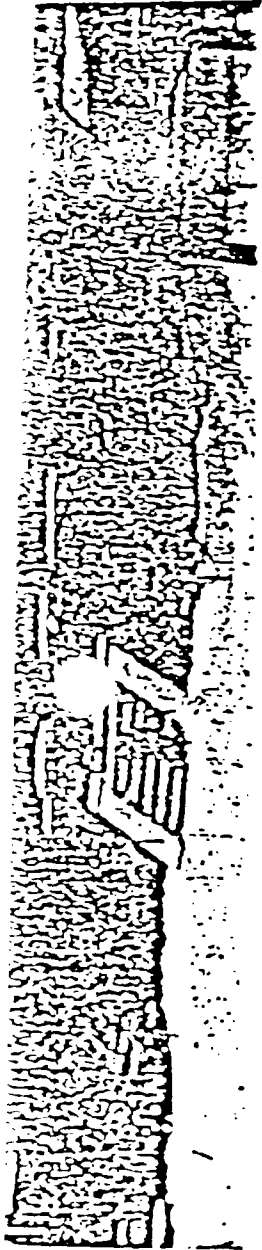
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The properties of the Saranac Laboratory consist of the original building, given to Dr. E. L. Trudeau by Mr. George C. Cooper in 1894 as a private research laboratory, together with the John Black Wing, of which a reproduction of a photograph appears in this report. The wing has been donated by Mr. and Mrs. Frank B. Black in memory of their son. The addition contains the library and lecture room, erected in 1927 and 1928, and private research rooms which are now in the process of construction. There are also two animal houses.

While the Saranac Laboratory cooperates with the Sanatorium in every possible way and serves as the headquarters for the Trudeau School of Tuberculosis, it provides diagnostic facilities to the physicians practicing in the village and carries on independent researches in the field of tuberculosis and associated conditions.

To avoid the existing confusion, the Trudeau Foundation is publishing an annual report of the Saranac Laboratory under separate cover.

The Saranac Laboratory, showing at the left the new John Black Wing





THE SARANAC LAKE ACADEMY OF MEDICINE

In the early part of July, 1931, a group of physicians in Saranac Lake met in the John Black Room to discuss ways and means for supporting the diagnostic and research activities of the Saranac Laboratory during a period of diminishing income. They were of the unanimous opinion that this institution is essential to the continued existence of the village as a center for the scientific treatment and study of tuberculosis. As a concrete expression of this feeling they constituted themselves the nucleus of a body to be known as the Saranac Lake Academy of Medicine. Its object is "to foster interest in the pursuit of scientific medicine in Saranac Lake" through the agency of the Saranac Laboratory. Its members pledge themselves to support the activities of this institution in every possible way and to seek assistance from others for its operation. The active members are physicians practising in Saranac Lake, but associate, sustaining, and life memberships are also open to interested laymen. In the financial report for the current year will be found a list of the present members.

The formation of the Academy created nothing new; the Laboratory, the Library, the diagnostic service, the scientific lectures and research have always been an integral part of the medical life of the village, but by many they have been freely accepted as a natural heritage from the great founder of this health community. By membership in the Academy of Medicine, or by contributions through it, anyone can feel that he has a part in keeping alive the Trudeau ideals for the furtherance of medical science.



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Relationships Between Hypersensitiveness and Immunity in Tuberculosis

DONALD E. CUMMINGS and ANTHONY B. DELAHANT

Tuberculosis of the Uterus and Fallopian Tubes with a Report of Two Cases Treated with X-rays

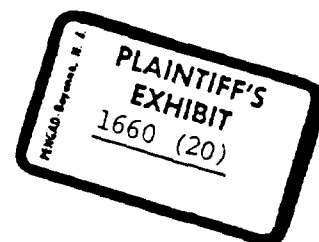
EDWIN M. JAMESON

Tuberculin: Its Preparation and Use in the Treatment and Diagnosis of Pulmonary Tuberculosis

LEROY U. GARDNER and EDWARD R. BALDWIN

physicians in Saranac Lake
and means for supporting the
Laboratory during a period
of unanimous opinion that this
of the village as a center
of tuberculosis. As a concrete
center the nucleus of a body
of Medicine. Its object is "to
be in Saranac Lake" through
members pledge themselves to
by possible way and to seek
active members are physicians
training, and life memberships
annual report for the current

nothing new; the Laboratory,
lectures and research have
of the village, but by many
age from the great founder
the Academy of Medicine,
that he has a part in keeping
medical science.



THE SARANAC LABORATORY FOR
THE STUDY OF TUBERCULOSIS
OF THE
EDWARD L. TRUDEAU FOUNDATION

Leroy U. Gardner, M.D.	Director and Pathologist
Arthur J. Vorwald, M.D.	Assistant Pathologist
Thomas M. Durkan, M.E.	Assistant Chemist
Winfield O. Kelley, B.A.	Clinical Pathologist
Douglas S. McCrum, B.S. (E.E.)	Photographer
Morris Dworski	Assistant in Experimental Pathology
Catherine M. Cummings	Librarian and Secretary
Roy Dayton	Financial Secretary
James V. Luttrell	Purchasing Agent and Technician
George Hulpritt	Technician
Anthony Delahant	Technician
Frank Creedon	Technician
Andrew J. Redlin	Voluntary Assistant
J. Cloyd Downs	Voluntary Assistant
William LaBounty	Assistant
Henry C. Stout	Assistant

FIELD AND CONSULTING STAFF

Donald E. Cummings, B.S.	Assistant Director in Charge of Field Work
Homer L. Sampson, D.Sc.	Consulting Roentgenologist
Daniel M. Brumfiel, M.D.	Clinical Consultant
Robert N. Downs	X-ray Supervisor
Richard Libby	X-ray Technician
Richard Walters	X-ray Technician
Melvin Berg	Bacteriological Technician and Clerk
Dorothy P. Rogers	X-ray Stenographer

SPECIAL RESEARCH STUDENTS

A. O. Severance, M.D.	Baltimore, Md.
A. Landau, M.R.C.P.	Cape Town, South Africa

ORY FOR
CULOSIS

UNDATION

____ Director and Pathologist
____ Assistant Pathologist
____ Assistant Chemist
____ Clinical Pathologist
____ Photographer
____ in Experimental Pathology
____ Librarian and Secretary
____ Financial Secretary
____ Purchasing Agent and Technician
____ Technician
____ Technician
____ Technician
____ Voluntary Assistant
____ Voluntary Assistant
____ Assistant
____ Assistant

STAFF

____ Director in Charge of Field Work
____ Consulting Roentgenologist
____ Clinical Consultant
____ X-ray Supervisor
____ X-ray Technician
____ X-ray Technician
____ Radiological Technician and Clerk
____ X-ray Stenographer

STUDENTS

____ Baltimore, Md.
____ Cape Town, South Africa

REPORT OF THE DIRECTOR OF THE SARANAC LABORATORY
FOR THE STUDY OF TUBERCULOSIS

— 1934 —

LEROY U. GARDNER, M.D., *Director*

A well known authority in the field of public health once remarked that the research student only begins to produce results of real significance when he is taken out of his laboratory and sent into the field. While some might qualify this generalization, it cannot be gainsaid that effective investigation of disease can only progress in close contact with the patient. In times past the Saranac Laboratory was a successful pioneer institution in the study of tuberculosis. Dr. Trudeau and Dr. Baldwin, with their associates, had ample clinical material about them on which they could draw for their scientific studies of this disease. When the problem of the inhalation of dust as a factor in the production of tuberculosis was begun there was little thought that it might deserve years of study and that it would subsequently prove to be a subject of widespread popular interest. For years the attack was directed almost wholly along experimental lines. Few persons suffering from disease due to inhaled dust found their way to Saranac Lake. To study silicosis in the human subject it was necessary to visit the centers of industry and such visits at best could be infrequent and of short duration. There seemed no choice but to continue on a purely experimental basis unless the investigation were removed to a mining or other industrial community. Then came years of stringency when the outlook for financial support from private philanthropies was most gloomy. But this apparent misfortune proved to be a turning point in the program of the institution. Because other sources of income had failed we were forced to make new alliances and in doing so were brought into intimate contact with the much needed clinical material for a well balanced investigation. It is hoped that we may profit by our opportunities and justify the confidence that has been placed in us.

To take advantage of the situation it was necessary to expand. Important members of the research staff had to be sent into the field to study conditions of dust generation and its effects upon men who work in it. New members had to be secured to investigate the problems that developed. More space was essential that these men might work, for the old laboratory was not expected to accommodate more than five or six investigators. Last year's report cited the progress that had been made in this program of expansion. This year sees us ready to begin operations on the broader basis.

Two major field investigations are in progress under the supervision of Mr. Cummings, the assistant director. Several thousand x-ray films have been taken and interpreted by Dr. Sampson and his assistants. Three more members have joined the regular laboratory staff and two graduate students will work with us during the coming year. The John Black Wing, providing six new rooms for research purposes, is now nearing completion and almost enough funds are in sight to satisfy a \$54,390.00 budget for the coming year.

FIELD PROGRAM

On November first a contract was renewed with members of the Lake Superior Iron Ore Producers Association to continue the program of investigation and prevention of disease due to dust among their miners. One company of the group decided not to participate in the program this year for reasons other than dissatisfaction with the services rendered. While their withdrawal materially reduces the income that we derive from this source, it is probable that responsibility for fewer men will enable us to make a more thorough study of those that remain. Last year's effort was devoted largely to a general survey of the industry and the inauguration of a program to prevent the formation of dust. This year the data already in hand will be analysed, the dust prevention measures will be applied to all parts of the various mines involved and examination of many of the miners will be repeated to determine whether they have developed changes that may be progressive. A considerable number of autopsies have been obtained upon men previously examined. A comparative study of the anatomical changes with the x-ray shadows in films made before death will add to the general knowledge of the action of mixtures of silica and other substances like iron. There is good reason to believe that the presence of the iron favorably influences the picture so that the silica is not as harmful as it might be when inhaled in the pure state. A bacteriological study of the sputum of miners with non-tuberculous infections of the lungs is in progress and autogenous vaccines are being used to treat some of these cases. A considerable number of infections with the Friedlander bacillus and associated organisms have been discovered.

Another study was begun in a small group of fluorspar mines and mills during the summer. The program involved the determination of a possible hazard from this substance and, if such exists, the recommendation of methods for its correction. A considerable group of employees has been examined by the mine physician and their x-ray films have been studied here. Tuberculosis is prevalent in the community as a whole but whether exposure to fluorspar dust is responsible has not yet been ascertained. No autopsies have yet been secured to determine the anatomical effects of inhaling this dust so that we shall be forced to rely upon animal experiments that are now in progress.

The field work in the gypsum plant reported last year is completed and it has been possible to give the industry a clean bill of health. Recently a survey was made of a porcelain plant and a plan of investigation was mapped out. It will proceed along the lines of other investigations.



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all thousand x-ray films have
and his assistants. Three more
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John Black Wing, providing
near completion and almost
\$20.00 budget for the coming

and with members of the Lake
continue the program of investi-
gation among their miners. One
feature in the program this year
is the services rendered. While
we hope that we derive from this
fewer men will enable us to
maintain. Last year's effort was
valuable and the inauguration
of this year the data already
gathered will be applied to all
studies of many of the miners
have developed changes that
autopsies have been obtained
to give a better knowledge of the anatomical
structure. Each will add to the
knowledge of the iron
silica and other substances
and the presence of the iron
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animal experiments that are

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started for other investigations.

All credit is due to Mr. Cummings for the successful prosecution of
this work. The officials of the companies with whom he is working have
repeatedly praised the work which he is doing and, here in the laboratory, we
are appreciative of the financial support made possible by his efforts, and of
the x-ray and autopsy material that comes through him. Without the co-
operation of Dr. Sampson, at the Sanatorium, such an investigation would
be quite impossible and the director is glad of the opportunity to express
his appreciation. The associated field workers, Mr. Downs, Mr. Libby
and Mr. Walters have loyally done their part in making a success of the
undertaking. They all deserve praise for their devotion to their work.

LABORATORY RESEARCH

The problems already under investigation have been continued during
the year. The inhalations of pure quartz, pure gypsum, pure hematite,
ferruginous chert and a mixture of gypsum and quartz are still in progress.
The hematite and gypsum dusts cause no appreciable damage in the lungs
and have no serious effect upon coexistent tuberculous infection. The chert,
which contains a considerable amount of quartz, causes more damage in the
normal lung and results in some progression of a tuberculous infection.
However, the changes that develop are not nearly as severe as those produced
by pure silica. Tuberculosis in the chert animals progresses for a time
and then becomes stationary or tends to heal with marked scarring,
or fibrosis. Mixtures of equal parts of gypsum and quartz dust fail to
produce significant changes in the lungs. On the other hand, groups of
animals exposed on alternate weeks to pure quartz and pure gypsum dust
are developing typical silicosis. This experience points to a protective action
on the part of gypsum dust; probably because the gypsum particles tend
to clump together in the atmosphere, they prevent the inhalation of significant
quantities of quartz. The experiment is not yet complete but the implications
are fascinating in their possible bearing upon silicosis prevention.

A study of the comparative reaction of different species of animals to
silica dust is now completed. Guinea pigs, rabbits, cats, white rats, white
mice, and domestic fowl have developed reaction to inhaled silica. The rats
develop changes most nearly resembling those in human beings. The injection
of silica suspensions into tadpoles and goldfish produces a marked tissue
reaction which resembles that in the mammals. One may conclude that silica
is a poison for the tissues of a large variety of animals.

Injection of silica and other forms of dust into the veins of rabbits is
being used extensively to test their capacity to cause damage. Silica causes
a specific cirrhosis of the liver which does not occur with other dusts thus
far treated. The minimum dose necessary to produce reaction and the effect
of different petrographic forms of silica are being investigated.

The progressive nature of silicosis in animals is being studied in animals
exposed for varying periods of time and then removed to a normal atmosphere.
X-ray films are taken from time to time to demonstrate progression.

The subject of tuberculous susceptibility in the silicotic tissues is still
under investigation. This year the possibility of alteration in the immune

state is being studied in silicotic animals infected with tubercle bacilli. Collateral experiments with pneumococcus and spirochaetal infections are planned to check the observations on tuberculosis. The marked similarity between the tissue reaction to the tubercle bacillus and silica particles suggests that the injury produced by these two substances may be fundamentally the same in spite of their obvious difference in composition.

Another set of experiments just started will test the tissue reaction to a representative group of silicates (silica in combination with bases) which have common industrial uses. Theoretically these silicates are not expected to produce serious damage in the body but the possibility that they may constitute an industrial hazard is often questioned. One of them, asbestos, is exceptional and is now a well recognized cause of pulmonary disease. Another known as sericite has been suggested as an important factor in aiding silica to produce the condition of silicosis.

Mr. McCrum has completed a series of wax models of silicotic nodules from the lungs of experimental animals and from those of human beings. These models demonstrate the similarity between the animal lesions and those in man. Both develop very largely in relation to branches of the pulmonary artery. Another group of models graphically illustrates how silicotic nodules compress and thus interfere with the function of the lymphatic vessels, the drainage system of the lung. Still another demonstrates how tuberculous infection penetrates into the interior of a preestablished silicotic nodule.

In addition to these studies, carried on by the regular laboratory staff, Dr. H. M. Kinghorn is continuing his study of a tuberculosis vaccine. Dr. J. N. Hayes is still working on the effect of inhaled oil and upon the problem of experimental oleothorax; Dr. E. M. Jameson is still studying genito-urinary tuberculosis. Dr. D. M. Brunfel is collecting data on the number of silicotic patients under treatment in tuberculosis sanatoria throughout the country. He is especially interested in ascertaining the effect of treatment in patients with a complicating tuberculosis.

TEACHING

In addition to the usual program of teaching, five days of the 1934 session of the Trudeau School of Tuberculosis were devoted entirely to the subject of silicosis. A program was arranged covering all phases of the subject: etiology, pathology, diagnosis by clinical and roentgenological methods, prevention, and medico-legal aspects. It is a pleasure to acknowledge our gratitude to the eminent authorities in their various fields who volunteered their services to lead the discussions. Dr. R. R. Jones, of the U. S. Public Health Service, spoke on etiology; Mr. D. E. Cummings, assistant director of the laboratory, covered other phases of his subject with special reference to atmospheric dust determination. The pathology of the disease was discussed by the director of the laboratory. Prof. Philip Drinker, of the Harvard School of Public Health, discussed engineering methods of dust prevention and elimination. Dr. H. K. Pancoast, of the University of Pennsylvania, and Dr. Homer L. Sampson, of the Trudeau X-ray Laboratory, spoke on the roentgenological appearances in silicosis. Dr. Henry S. Kessler, N. J. Rehabilitation Clinic,



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described the clinical aspects of the disease. Prof. Wm. S. McCann, of the University of Rochester, spoke on the physiology of the fibroid lung. Dr. A. J. Lanza of the Metropolitan Life Insurance Company summarized the scientific aspects of the discussion and outlined the measures that are being adopted to handle the problem both from the medical and legislative viewpoints. Mr. Paul Folger, an attorney from Rochester, N.Y., discussed the medico-legal phases of the subject. Most of the speakers remained for the entire week and took part in the informal discussions that constituted a very important part of the session. The John Black Room was crowded to capacity. Fifty-two special students registered for the week; 14 men from the regular tuberculosis course elected to remain and the rest of an audience of 130 was made up of invited guests and local physicians. The group was composed of industrial physicians and executives, insurance officials, and state compensation commissioners.

An unofficial transcript of the proceedings was prepared by Mr. B. E. Kuechle of the Employers Mutual Insurance Company of Wausau, Wisconsin, and his associates Drs. Belknap, Benton, Carhart, Enzer, Ford, Gray, Habbe, and Lotz. Copies were offered for sale at \$5.00 and the entire proceeds were donated to the laboratory. It is with peculiar pleasure that we express our gratitude to Mr. Kuechle and those who assisted him in this work.

PUBLICATIONS AND REPORTS

Only four papers have been published this year owing to the fact that pending experiments have not yet been completed. These have been of a general nature, dealing with the etiology and pathology of silicosis and other pneumonokonioses. A reprint of one of them, delivered before the general session of the American Medical Association and representatives of the group is included in this volume. Others were presented before the American Institute of Mining and Metallurgical Engineers, the National Safety Congress, and the Radiological Society of America. A general article, "Pneumonokoniosis," written for International Clinica, will appear in June. Three papers by Dr. Gerald R. Dowd, formerly bacteriologist on the staff, are in press. Addresses were made before the physicians of the General Electric Company at Schenectady, and before a legislative committee of the State of Massachusetts. Considerable time has been devoted to the meetings of a committee of the Konicide Club appointed to formulate a classification of silicotic lesions and their appearances on the x-ray film. It is the hope of this committee to offer a standard nomenclature that can be generally adopted.

This volume also contains reprints of an address on Hypersensitiveness and Immunity in Tuberculosis by Mr. Cummings and Mr. Delahant, of a paper by Dr. Jameson on Tuberculosis of the Uterus and Fallopian Tubes, and a Summary on Tuberculin by Dr. Baldwin and the director.

STAFF

On October first Dr. Arthur J. Vorwald joined the staff as assistant

pathologist. Trained at the University of Chicago, and coming to us after a year of post-graduate work at Cambridge, he brings to our problems fresh points of view. His excellent training and his enthusiasm have already satisfied everyone that he is a most fortunate choice.

Mr. J. Cloyd Downs, a chemical engineer of distinction, is a voluntary assistant who has many times proved his worth by solving problems concerned with the preparation of dusts for animal injection. We consider ourselves most fortunate that he can be with us.

Mr. Frank Creedon worked so well and faithfully as a voluntary assistant last year that he was taken on to the regular staff as histological technician on October first.

Two special research students are already at work upon silicosis problems, and a third will arrive shortly. Dr. A. O. Severance, of Baltimore, has carried on experiments dealing with silicosis in fish and amphibia. Dr. A. Landau, M.R.C.P., of Cape Town, South Africa, recently came to us from Brompton Hospital on a Dorothy Temple Cross Research Fellowship. He is working on the comparative influence of various silicates on the susceptibility to tuberculous infection. Dr. F. Warden Brown, an Oxford graduate holding a Radcliff Travelling Fellowship, will shortly begin an intensive study of the action of one of the silicates known as sericite. It was recently claimed that this substance rather than quartz was the cause of silicosis.

In the field Mr. Richard Walters served faithfully as x-ray technician for six months until his health forced him to return for a period of rest. His work was appreciated not only here in his own organization, but by the physicians with whom he was associated at a mine hospital. We trust that the interruption is only temporary.

The other members of the staff remain as heretofore. The director takes this opportunity to thank all of them for the loyal service that they are rendering and expresses his appreciation of their cooperation.

BUILDINGS

A year ago it was announced that Mr. and Mrs. Frank B. Black had offered to provide funds for additional laboratory work rooms. The John Black Wing is now nearing completion. It consists of the John Black Room, the library and lecture room which these generous donors gave in 1927, and their recent gift of five new private laboratories located in a story above. In order to satisfactorily join the roof of the new wing with that of the old building it was necessary to extend the front gable of the latter. By so doing another large, well-lighted room was created in the attic of the old building. The photograph as reproduced in the front of this report shows the great improvement made in the front elevation by this change. The six additional work rooms and offices will fill a long-felt want by relieving the chronic state of congestion that has seriously hampered our work in the past several years. A necessary adjunct to the new addition was an increase in the heating plant. Rather than supplement an already overloaded system, it was found to be more economical to install new furnaces and to repipe the entire plant. Two new oil furnaces with a coordinated system of piping

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are now in operation. It appears that the heating costs for the entire plant, including the new addition, may be less than that for the old building alone. Our gratitude to Mr. and Mrs. Black for this new gift is unbounded, and as we occupy and use the new plant we shall have a continual cause to be mindful of their generosity.

Toward furnishing and equipping the new work rooms, we have already received \$1250. Of this sum \$250.00, from Mr. Henry U. Harris, was acknowledged last year. Dr. Frederick Willson has recently donated \$1000, which is deeply appreciated. This sum will suffice to put two or more rooms into commission, and as fast as further funds can be procured the others will be furnished and occupied.

CLINICAL LABORATORY WORK

The diagnostic department has operated most effectively under the direction of Mr. Kelley, assisted by Mr. Delahant and Mr. Hulpritt. While the fees collected are entirely inadequate to support the service, the receipt of \$1229. from the Saranac Lake Academy of Medicine has made its continuation possible. Mr. Kelley's fellowship at the Sanatorium secures him his living expenses and his part-time associates receive part of their salaries from the Academy receipts. The following is a summary of the various diagnostic examinations made during the year ending December 31, 1934:

SUMMARY OF DIAGNOSTIC EXAMINATIONS November 1, 1933 to December 31, 1934

Diphtheria cultures	9	for tubercle bacillus	109
Smears for Vincent's Angina	30	Stomach contents	4
Blood:		Milk, bacteriological counts	48
Agglutination for typhoid	36	Water, bacteriological examination	75
Differential counts	161	Water, chemical examination	426
Red and white counts	269	Smears for gonococcus	6
Hemoglobin determinations	111	Urine	1337
Coagulation time	43	Autogenous vaccines prepared	19
Grouping	101	Pathological specimens	130
Cultures	13	Autopsies, human	24
Chemistry	82	Animals inoculated for diagnosis	46
Sedimentation	54	Miscellaneous examinations	280
Sputum for tubercle bacillus	1577		
Spinal fluid, urine and other material		Total	4990

Of the autopsies performed, 7 were on cases of silicosis with tuberculosis sent to the laboratory from the field. One was a case of uncomplicated silicosis with death from generalized cardio-vascular renal disease. Of the "pathological specimens" 8 were lungs or portions of lungs from individuals who died after being exposed by occupation to dust of one kind or another. These were submitted for diagnosis by physicians in various parts of the country.

PLAINTIFF'S
EXHIBIT
1660 (28)

FINANCES

At the end of the fiscal year, September 30, 1933, the financial statement showed an apparent balance of \$3,654.87. This was accounted for by advance payments of certain annual grants made during the fiscal year. The money was allocated to specific researches that were completed during the year. Likewise, at the end of the current year, there is an apparent balance of \$10,390.81, which represents advance payments for work to be done during the coming year. In June a group of Mutual Insurance Companies through the American Mutual Alliance pledged their support to a three years' silicosis research program and paid their first annual installment of \$5,000 in September. In October a similar group of stock insurance companies, through the National Bureau of Casualty and Surety Underwriters, made a similar three-year pledge and recently paid one semi-annual installment of \$2,500. Each of these groups is financing certain specific problems of mutual interest to them and to the laboratory. The Metropolitan Life Insurance Company has renewed its annual pledge of \$5,000. for the continued study of infection in association with silicosis.

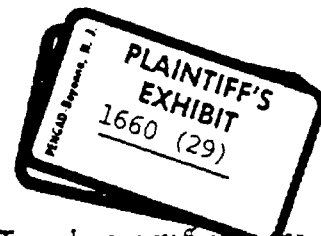
The U. S. Gypsum Company made an additional grant of \$1,000. for the continuation of experimental studies on the protective action of gypsum dust against the inhalation of silica. Experiments begun during the past year were not completed and they seemed of sufficient importance to warrant continuation.

The decreased income from the iron ore study has been apportioned between field and research laboratory expenses in approximately the same ratio as last year. After deducting the costs of carrying on the work in the field and the payments due Dr. Sampson's laboratory for x-ray consultation, there remains only about \$6,110. to carry on animal experimentation. This will not cover the actual cost of the work here but it is of such importance that the balance is being provided from other sources. The fluorspar study, with a grant of \$3000. is self-supporting as no long-term dust inhalation on animals is involved.

The receipts from Mr. Kuehle's sale of Silicosis Symposium proceedings have amounted to \$655., but none of this money was received prior to the end of our fiscal year on October 31, 1934. A contract for diagnostic work at the Northwoods Sanatorium has been renewed with the Adirondack Fund for the Tuberculous. This yields \$1,000. which is applied toward an assistant's salary. The Agnes Musser Eckert Fellowship provides for another worker. The loyal support from the Milbank Memorial Fund constitutes a back-log on which we have relied so long. Receipts through the Saranac Lake Academy of Medicine amounted to \$1,229., all of which was applied to the operation of the diagnostic department.

E. R. Squibb & Sons made an appropriation of \$200.00 to Dr. J. N. Hayes for his investigation of the action of various oils in the pleural cavity.

For the coming year anticipated operating expenses will amount to \$54,390. in addition to a sum of \$8,500. to equip and furnish the new work rooms in the John Black Wing. Income is in sight to cover all but \$4,000. of the regular budget and we have faith that this and the special



30, 1933, the financial statement his was accounted for by advance ring the fiscal year. The money ere completed during the year. there is an apparent balance of ents for work to be done during al Insurance Companies through support to a three years' silicosis nual installment of \$5,000 in ock insurance companies, through y Underwriters, made a similar mi-annual installment of \$2,500. ecific problems of mutual interest politan Life Insurance Company r the continued study of infection

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priation of \$200.00 to Dr. J. N. various oils in the pleural cavity. rating expenses will amount to). to equip and furnish the new ome is in sight to cover all but ve faith that this and the special

equipment fund will be secured during the year. To make our staff complete we should have a petrographer to identify and analyse the rock specimens from which dust for experiments are now prepared. At the present time we are forced to rely upon the generosity of others for this service.

In conclusion the director wishes to express his gratitude to Dr. Baldwin, director of the Trudeau Foundation, for his hearty support, to all his associates for their loyal cooperation, and to those whose financial assistance has made possible the continuation of our work.

SARANAC LABORATORY FOR THE STUDY OF TUBERCULOSIS

RECEIPTS AND EXPENDITURES

OCTOBER 1, 1933 TO SEPTEMBER 30, 1934

Receipts:

Balance on hand October 1, 1933	\$3,654.87
From endowment held in trust by Trudeau Foundation	\$1,875.00
Other interest and exchange	15.69
	<u>1,890.69</u>
Gifts for maintenance of work:	
Adirondack Fund for the Tuberculous	1,000.00
Mr. Henry Upham Harris	250.00
Hillside Fluor Spar Mines	250.00
Dr. Leroy U. Gardner	375.00
Dr. Hugh M. Kinghorn (on pledge)	1,000.00
Mr. Lawrence Macfarlane	300.00
Metropolitan Life Insurance Co. ..	3,749.94
Michigan Ore Mines	27,500.00
Milbank Memorial Fund	3,000.00
Miscellaneous Gifts *	105.00
National Association of Mutual Casualty Companies	5,000.00
Oglebay Norton & Company	416.67
Mr. Arthur B. Purvis	750.00
Roselaire Lead & Fluorspar Mining Companies	375.00
Saranac Lake Academy of Medicine* ..	1,229.00
E. R. Squibb & Sons	200.00
U. S. Gypsum Company	2,875.00
Total of gifts	<u>48,375.61</u>
	<u>50,266.30</u>
Total receipts (carried forward)	53,921.17

* See following pages for list of donors



STUDY OF TUBERCULOSIS

SARANAC LABORATORY FOR THE STUDY OF TUBERCULOSIS

EXPENDITURES

RECEIPTS AND EXPENDITURES

SEP 30, 1934

OCTOBER 1, 1933 TO SEPTEMBER 30, 1934

----- \$3,654.87

.875.00
15.69
----- 1,890.69

1,000.00
250.00
250.00
375.00
1.00
31
3,749.94
7,500.00
3,000.00
105.00

5,000.00
416.67
750.00

375.00
1,229.00
200.00
2,875.00

----- 48,375.61
----- 50,266.30
----- 53,921.17

Total receipts (brought forward) ----- 53,921.17

Disbursements:

For Laboratory work and maintenance:

Salaries ----- 18,905.14
Supplies and equipment ----- 2,211.46
Animals and feed ----- 1,915.04
Fuel ----- 704.55
Gas ----- 162.57
Electric light and power ----- 500.63
Library ----- 450.66
Telephone ----- 103.01
Laundry ----- 79.52
Publications ----- 396.35
Travel ----- 246.84
Repairs ----- 69.46
Miscellaneous ----- 96.70
----- 25,841.93

For work in the field:

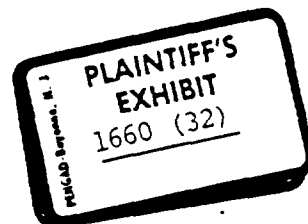
Salaries ----- 14,219.98
Travel, including automobile, etc -- 1,533.43
Advances to workers for expenses 625.00
Miscellaneous ----- 111.54
----- 16,489.95

Total cost of work ----- 42,331.88

Transferred to Trudeau Foundation,
reimbursement for funds advanced
for new animal house built in 1933 ----- 1,198.48

Total disbursed ----- 43,530.36

Balance on hand September 30, 1934 ----- 10,390.81



CONTRIBUTIONS
TO THE
SARANAC LABORATORY

From October 1, 1933 to September 30, 1934

(NOTE: Items in second column received after October 1st
to be credited in 1935 financial report)

Adirondack Fund for the Tuberculous	1,000.00	249.99
Mr. and Mrs. Frank B. Black, for building		5,500.00
Mrs. Bigelow Crocker, thru Dr. H. M. Kinghorn	5.00	5.00
Mrs. Charles L. Crocker, thru Dr. H. M. Kinghorn	25.00	50.00
Mr. Henry Upham Harris, toward new building	250.00	
Hillside Fluor Spar Mines	250.00	500.00
Dr. Leroy U. Gardner	375.00	25.00
General Refractories Company	50.00	
Dr. Hugh M. Kinghorn (fulfilling pledge toward animal house completed 1933)	1,000.00	
Mr. B. E. Keuchle and associates, sale of publication, "Silicosis Symposium"		655.00
Mr. Lawrence Macfarlane, thru Dr. H. M. Kinghorn	300.00	
Metropolitan Life Insurance Company	3,749.94	2,499.96
Michigan Ore Mines, thru Pickands, Mather & Company	27,500.00	6,358.54
Milbank Memorial Fund	3,000.00	
National Association of Mutual Casualty Companies	5,000.00	
National Bureau of Casualty and Surety Underwriters		2,500.00
North American Refractories Company	25.00	
Oglebay, Norton & Company	416.67	
Mr. Arthur B. Purvis, thru Dr. H. M. Kinghorn	750.00	
Rosidaire Lead and Fluorspar Company	375.00	375.00
Carried forward	42,971.61	18,718.49



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2,500.00
25.00
416.67
750.00
375.00 375.00
42,971.61 18,718.49

Brought forward 42,971.61 18,718.49
Saranac Lake Academy of Medicine
Mrs. John F. Archbold 50.00
Clinton J. Ayres, Inc. 25.00
Dr. Edward R. Baldwin 50.00
Dr. Robert J. Beck 50.00
Boyce & Roberson 15.00
Dr. H. A. Bray 10.00
Dr. H. B. Brown 20.00
Dr. Lawrason Brown 25.00
Dr. David A. Cooper 10.00
Mrs. F. C. Deemer 50.00
Dr. Joseph T. Eagan 50.00
Mrs. A. C. Erkander 50.00
Mr. H. C. Eyer 25.00
Miss Anna L. Gilbert 10.00
Dr. Albert G. Hahn 10.00
Dr. John N. Hayes 25.00 15.00
Dr. Fred H. Heise 10.00
Mr. Fred A. Howland 50.00
Dr. E. M. Jameson 25.00
Dr. Hugh M. Kinghorn 50.00
Mr. Herbert R. Leggett 25.00
Mr. Wm. C. Leonard 5.00
Dr. S. S. Lichtman 10.00
Dr. Edgar Mayer 34.00
Mr. H. S. Parker 50.00
Mr. R. F. Plank 10.00
Dr. Samuel Post 10.00
Dr. J. Woods Price 25.00
Dr. Walter L. Rathbun 10.00
Dr. John C. Russell 10.00
Dr. Homer L. Sampson 50.00
Sanatorium Gabriels 25.00
Miss Ophelia Sawtell 10.00
Dr. David T. Smith 10.00
Miss Dorothy Smith 10.00
Mr. Robert B. Smith 100.00
Carried forward 43,905.61 18,803.49

PLAINTIFF'S
EXHIBIT
1660 (34)

Brought forward	43,905.61	18,803.49
Dr. Willard B. Soper	50.00	
Dr. Earl R. Templeton	10.00	
Mr. Lewis S. Thompson	50.00	
Dr. Charles C. Trembley		25.00
Miss Jean Turnbull	20.00	
Dr. William A. Wardner	50.00	
Dr. George E. Wilson	65.00	
In Memory of Sydney Lunt Wood	50.00	
Dr. Warriner Woodruff		25.00
E. R. Squibb & Sons, thru Dr. J. N. Hayes	200.00	
U. S. Gypsum Company	2,875.00	250.00
Utica Mutual Insurance Company		100.00
Dr. Frederick and Mr. Thomas A. Willson, toward equipment of building		1,000.00
Mrs. S. L. and Mr. John P. Wood, in Memory of Sydney Lunt Wood	10.00	
	45,375.61	20,213.49

Mr. Frank Connable, thru Dr. Elliott P. Joslin,
a Microchemical Sugar Apparatus