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FIFTH ANNUAL REPORT

OF THE

COLLIS P. HUNTINGTON MEMORIAL HOSPITAL
FOR CANCER RESEARCH

AND OF THE

LABORATORIES

OF THE

CANCER COMMISSION OF HARVARD UNIVERSITY

1916–1917

(FOR THE YEAR ENDING JUNE 30, 1917)

BOSTON
MASSACHUSETTS

COLLIS P. HUNTINGTON MEMORIAL HOSPITAL FOR CANCER RESEARCH.

THE MEDICAL SCHOOL OF HARVARD UNIVERSITY, BOSTON, MASS.

Cancer Commission of Harvard University

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THE CANCER COMMISSION OF HARVARD UNIVERSITY

FOUNDED BY CAROLINE BREWER CROFT

JUNE 16, 1899.

J. COLLINS WARREN, M.D., *Chairman.*

HENRY K. OLIVER, M.D.
J. COLLINS WARREN, M.D. } For the Caroline Brewer Croft Fund.

HENRY P. WALCOTT, M.D.
EDWARD H. BRADFORD, M.D. } For the Corporation of Harvard College.

WILLIAM T. COUNCILMAN, M.D.
E. E. TYZZER, M.D. } For the Harvard Medical School.

ARTHUR ADAMS, *Treasurer.*

ROBERT B. GREENOUGH, M.D., *Secretary.*

WILLIAM DUANE, PH.D., *Research Fellow in Physics.*

CLARENCE C. LITTLE, S.D., *Research Fellow in Genetics.*

WILLIAM T. BOVIE, PH.D., *Research Fellow in Physics.*

HENRY LYMAN, M.D., *Research Fellow in Chemistry.*

A. A. GHOREYEB, M.D., *Research Fellow in Pathology.*

COLLIS P. HUNTINGTON MEMORIAL HOSPITAL FOR CANCER RESEARCH.

ROBERT B. GREENOUGH, M.D., *Surgeon in Charge.*

CHANNING C. SIMMONS, M.D., *Assistant Surgeon.*

EDWARD H. RISLEY, M.D., *Assistant Surgeon.*

HENRY A. CHRISTIAN, M.D., *Consulting Physician.*

FRANCIS W. PEABODY, M.D., *Consulting Physician.*

D. CROSBY GREENE, M.D., *Consulting Laryngologist.*

GEORGE A. LELAND, JR., M.D., *Surgeon to Out-Patients.*

GEORGE BENET, M.D., *Resident Surgeon.*

ERNEST W. DALAND, *House Officer.*

IRENE W. MASON, R.N., *Matron.*

ANNA L. GIBSON, R.N., *Assistant Matron; Matron.*

THE MEDICAL SCHOOL OF HARVARD UNIVERSITY

LONGWOOD AVENUE, BOSTON, MASSACHUSETTS.

REPORT OF THE CHAIRMAN OF THE COMMISSION

TO THE

CANCER COMMISSION OF HARVARD UNIVERSITY.

GENTLEMEN: I have the honor to submit to you the fifth annual report of the Collis P. Huntington Memorial Hospital and of the various departments of the Commission for the fiscal year ending June 30, 1917.

Since the efforts first exerted by the Commission to expand its work from that made possible by the Croft bequest to a larger field of usefulness, the Commission has obtained funds which have enabled it to build and conduct a hospital of twenty-five beds for a period covered by these reports, of a little over five years, and to establish a plant which now represents a valuation of about six hundred thousand dollars, and involves an annual expenditure of nearly fifty thousand dollars. With these funds it has been enabled not only to support the hospital, but to conduct investigations into the origin and treatment of cancer. For this purpose the Commission has organized a hospital staff, consisting of experts in the care and treatment of the disease. It has also brought together a group of scientific investigators engaged in research into the problems which the progress of the work brings forward from time to time for solution. A glance at the pages of this report will show its varied character.

At the outset a study of the parasitic origin of cancer was conducted by the pathologist and the parasitologist. Scientific research of world-wide distribution has thus far failed to discover any organism which could place cancer upon the list of diseases of microbic origin. Many methods of treatment have been taken up and tested by the Commission, such as the Hodenpyle serum and the colloidal solutions. The more recent activities of the Commission have

been concerned with the problems which the discovery of radium and other forms and applications of light rays have brought into prominence.

The addition to the staff of investigators of the physicist has enabled this Commission to lead the way in a new line of study: the application of the science of physics to medical research. Under the direction of Prof. William Duane, a Department of Bio-physics has recently been established by the Corporation of the University. Under his supervision there has been conducted for the last five years a systematic study of the action of light rays upon cancer, and their incidental effects upon normal tissues. Professor Duane's work has been chiefly concerned in the perfection of a method of obtaining the "emanation" from radium in a pure state and preparing it in a form serviceable for therapeutic purposes. For the past two years he had been engaged in coöperation with the laboratory of the General Electric Company at Schenectady, New York, in perfecting a high frequency and high tension generating plant to be used with Coolidge X-ray tubes. With such an X-ray machine of greatly increased power it is expected that an agent will be obtained which represents the efficiency of several grams of radium (in value of over half a million dollars). The importance of such work in the further development of radiotherapy can easily be imagined. These experiments, now being carried on in the Jefferson Physical Laboratory, are progressing toward completion.

Dr. W. T. Bovie's research work on the action of rays of light upon the living cell in a state of active division has a most important bearing upon the underlying conditions of cancer and growth in general. During the past year he has devised new apparatus for carrying on these researches and has shown great originality in developing new lines of investigation.

In common with many other institutions, the Commission has suffered from the loss of active workers, who have been called into the service of a country at war. Dr. Little's studies in genetics, illustrated by the observation of hereditary

tendencies in some of the smaller animals (mice), are based upon a plan of long and patient investigation which it is hoped may help to solve the question of the susceptibility to cancer in certain families.

Dr. Henry Lyman, who has also been called to the front, is a pioneer in our Chemical Department. It is quite possible that the solution of the cancer question may prove to be a chemical one, and the chairman is glad to be able to announce that a considerable sum of money has been offered for the further development of the Chemical Department of the Commission when conditions permit.

The Commission also has furnished small amounts of emanation to Dr. Redfield, who, working in Dr. Alexander Forbes' laboratory, has made some interesting and important observations on the effects produced by the rays in embryonic tissues.

The amount of radium has been more than doubled during the past year and now amounts to one gram, representing a value of about one hundred thousand dollars.

The expansion of the work of the Commission along the lines above indicated has shown the importance of the construction of a new building or annex to the hospital, specially designed for all this original work. The hospital itself has a constantly increasing service, and the large number of out-patients calls for additional accommodations. Designs are being prepared, which will be referred to more at length in the report of the secretary, Dr. Robert B. Greenough, where the valuable radium plant, the new X-ray machine, and specialized chemical laboratories can be suitably housed.

During the year plans have been made to supply the State of Massachusetts with what is called a Free Diagnosis Service. One of the difficulties in obtaining accurate statistics of cancer is due to the frequent lack of accurate pathological investigation of the supposed cancer tissue. A microscopic examination by a competent authority is often wanting. The Commission has therefore planned to supply this service for the physicians and hospitals of Massachusetts, to whom it is not otherwise available. Such aid from the Commission can-

not fail to be of great practical value throughout the State in favoring the early recognition and the effective treatment of cancer. Too much stress cannot be laid upon the importance of the fact that it is in its early stages that cancer is a curable disease.

A novel and valuable instruction in nurses' laboratory technic has been given during the past year by our matron, Miss Gibson. Her text-book for nurses prepared for this purpose is the first of its kind. This new field of work for the trained nurse is an important addition to her store of knowledge, and is bound to be of great help, both to hospitals and to practitioners of medicine.

The work of the Commission has shown during the past year that a slow but steady progress is being made towards the solution of the proper method of treating cancer. No panacea has yet been discovered, but a backward glance gives ample evidence that much has been accomplished. In the more superficial forms of the disease, such as are seen so frequently on the face, many cures are effected by radium, and the deformity consequent upon radical surgical operations is thus avoided. In some of the internal forms of malignant disease the results of radiotherapy are encouraging. Where the disease cannot be cured, in many instances its course can be alleviated, the sufferer may obtain a blessed respite, sometimes of months' duration, even though the diseased process eventually reasserts itself and life is only temporarily prolonged.

In the course of the year cases representing many of the complications of cancer are brought into the hospital, and some examples of what may be fitly called disease in its more repulsive aspect are always to be found there. In old times such cases, after wandering in vain from one hospital to another for relief, finally ceased to put in an appearance, having crept for the last time into their tenements to pass through the final stage. To many such cases our skilled nurses and physicians give aid and comfort in our wards from the resources at their command. Such help would not

have been possible but for the assistance and sympathy of a generous public.

The chairman would like to bear testimony to the loyal response which has been made to the appeal of this Commission. It has thus been able not only to build and maintain this hospital, but to conduct its work on a scale which gives hope for future expansion along lines which will enable the Commission to look forward confidently, not only to the ultimate solution of the cancer problem, but also to the attack upon some of the other unsolved problems in medicine as well.

(Signed) J. Collins Warren.

REPORT OF THE SECRETARY OF THE COMMISSION

TO THE

CANCER COMMISSION OF HARVARD UNIVERSITY.

GENTLEMEN: The Secretary has the honor to submit the following annual report to the Cancer Commission for the year ending June 30, 1917:

The resignation in September, 1916, of Dr. E. E. Tyzzer as Director, to accept the George Fabyan professorship of Comparative Pathology in the Harvard Medical School, deprived the Commission of the valuable services which he had given in the control of the general activities of the Cancer Commission, especially in the pathological laboratory and the research work on tumor pathology which he had carried on. Dr. Tyzzer was appointed a member of the Cancer Commission from the Medical School to fill the vacancy caused by the resignation of Dr. Theobald Smith, and his interest in the work of the Commission has been continued, and he has given the greatest assistance in advising with the various working members of the Commission. No appointment was made in 1916–1917, to fill the vacancy caused by Dr. Tyzzer's resignation as Director, but the work was carried on under a general committee organization, with Dr. R. B. Greenough acting as chairman of this committee.

In April, 1917, Mr. Arthur Adams, the treasurer of the Commission, was ordered to active duty in the Navy, and his place has been filled by Mr. Roger Pierce, as acting treasurer.

Dr. Albert A. Ghoreyeb was appointed Research Fellow in Pathology, on a half-time basis for 1916–1917, giving the other half of his time to the Department of Pathology. Dr. Ghoreyeb carried on the necessary pathological work of the Huntington Hospital, in performing autopsies and in the examination of surgical material. It was his intention to

complete some investigations, by means of corrosive specimens, upon the circulation of tumors, but this work was not completed. In June, 1917, Dr. Ghoreyeb obtained leave of absence and entered the Medical Reserve Corps, U.S.A., and is now abroad.

Dr. Henry A. Lyman continued his work in chemistry at the Huntington Hospital, in relation particularly to the measurement of calcium and of uric acid in the blood. Certain modifications of technic of these chemical tests were devised by him, but the work could not be completed, as Dr. Lyman was a member of the Medical Reserve Corps, U.S.A., and was called to active duty in May, 1917. A method of sterilization of needles, knives, and sharp instruments in oil was devised by Dr. Lyman, and demonstrated to the Boston Surgical Society in April, 1917, as well as published in the Journal of the American Medical Association.

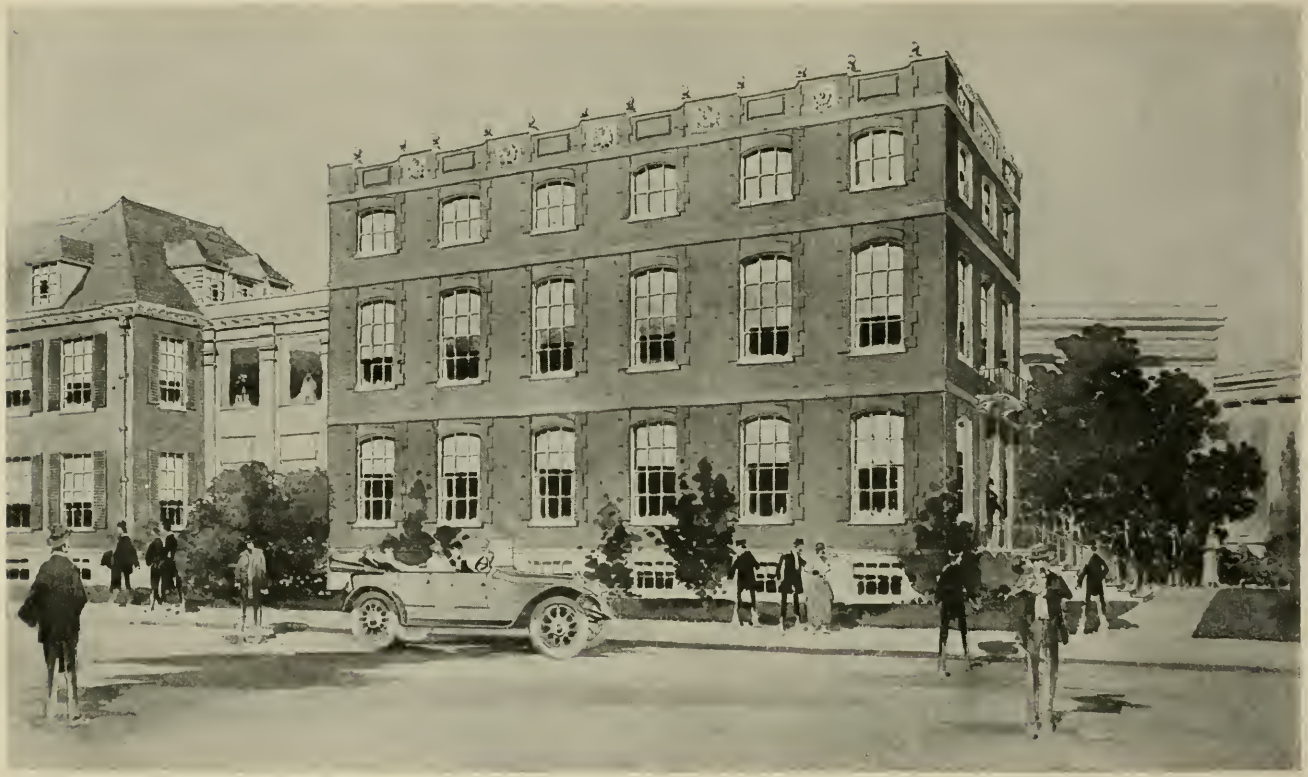
Dr. C. C. Little gave only half time to the Cancer Commission in 1916–1917, as he was called to take the position of Assistant Dean in Harvard University. He continued, however, the problems in genetics which he had been studying under the general direction of Dr. Tyzzer. The production of deciduoma in the rat, the inoculation of embryonic chick tissue into mice, and certain studies of the heredity factors producing immunity to tumor inoculation in mice, were the subjects to which Dr. Little devoted special attention. It was not possible to bring any of these problems to a definite conclusion during the year, and in June, 1917, Dr. Little entered the Officers' Reserve Corps, and attended the training camp at Plattsburg. The work of his laboratory has been carried on by the Commission, under Dr. Tyzzer's general direction, and it is hoped that the work can be taken up again when the war is over.

Dr. W. T. Bovie has been carrying on a most interesting series of investigations in regard to the physiological effects of radiation. These studies have related chiefly to the accumulation of data in regard to the permeability of protoplasm by radiation, as measured by its resistance to the passage of

an electric current. One of the most interesting phenomena developed by these investigations is the relation of temperature to the effects of radiation. It appears that radiation sensitizes tissues in such a way that they become sensitive to degrees of temperature which do not affect similar normal tissues. While this work has not yet been carried to definite conclusions, it is a matter of great interest at the present time, because of its possible clinical application, as well as for its value in relation to the obscure results of radio-activity.

Dr. William Duane has continued his work in the accumulation and preparation of radium for therapeutic use, as well as giving a large amount of his time to the study of special methods and doses for the clinical application of radium therapy to patients in the hospital. In addition to the work with radium, Dr. Duane has carried on experimental work upon high-power X-ray apparatus, and has been engaged in the construction of a high voltage X-ray plant for clinical use in the hospital, and in the determination of measures for its safe application, and for the accurate measurement of dosage. In March, 1917, at the request of the Huntington Fund for Cancer Research in New York, opportunity was given to Dr. Duane to assume an advisory position at the General Memorial Hospital in New York in order that they might have the benefit of his knowledge and advice on problems of radio-activity. This movement of coöperation has been most successful, and the work of the two Commissions has been more directly coördinated, and most satisfactory relations have been established.

Tentative plans have been drawn by Coolidge & Shattuck, architects, of Boston, for a new laboratory building, to be erected on Huntington Avenue, immediately adjoining the east wing of the Collis P. Huntington Memorial Hospital, and connected to it by corridors on the first and second floors. This building will give much needed accommodation for several departments of the Commission's work. The basement will contain a vault for the storage of radium, and for experimental work in radio-activity, and rooms for the installation of high-powered X-ray apparatus, and for the application of



PROPOSED NEW LABORATORY BUILDING, CANCER COMMISSION OF HARVARD UNIVERSITY.

Coolidge & Shattuck, Architects, Boston.

X-ray treatment. There will be space in the basement, also, for a carpenter shop, a chemical laboratory, and a clinical laboratory for the instruction of nurses, storage space, toilet rooms, and a suite for the use of the resident physician.

On the first floor there will be provided additional waiting-rooms for out-patient cases — a serious want at the present time — large laboratories of bio-physics, a woman's dressing-room, and rooms for X-ray and for radium treatments.

On the second floor practically all of the space will be given up to the laboratories of pathology and of biology.

The top floor of the building will provide accommodation for the domestic service of the hospital, and permit the entire top floor of the main building to be used for nurses.

The building as planned is of fireproof construction — brick and stone — but of the simplest character, and with rough interior finish. It is estimated that the sum of $60,000 will be needed for its construction, toward which certain gifts of money have already been received.

If funds for the erection of this building can be secured it is believed that the work of the Commission will be greatly aided, as work which is now done in many different laboratories in the Medical School will be brought together under one roof, and at the same time the urgent need of the hospital itself for greater accommodation for out-patient cases, and for space for radium and X-ray treatments, as well as additional domestic quarters, will be made available.

During the spring of 1917, in response to the recommendation of the Committee on Cancer of the Massachusetts Medical Society, a project for the free diagnosis of pathological material in Massachusetts was taken under consideration by the Cancer Commission. Similar services for the free diagnosis of cancer tissue had been inaugurated in a number of other states. It was found, however, that the inauguration of such a service had been criticised in other cities on the ground that it might lead to the indiscriminate practice of cutting into cancer tissue for diagnosis, and thus defeat its own object by leading to a spread of the disease and preventing its radical removal by surgical operation. The

question appearing to be one of serious consequence, a questionnaire was prepared and sent out to the members of the American Surgical Association, the Clinical Surgical Society, the American Gynæcological Association, the members of the Association for Cancer Research, and the directors of the American Society for the Control of Cancer. The replies received from these questionnaires were presented for discussion at a meeting of the American Surgical Association in Boston, in June, 1917, and were published in the Annals of Surgery. As a result of this analysis of the best obtainable surgical opinion of the country, a project for the inauguration of a service for the free diagnosis of pathological material was prepared, in coöperation with the State Department of Health of Massachusetts.

The Huntington Hospital has shown a considerable increase in the number of new cases during the year, and a large amount of data has been collected upon the results of radiotherapy and other methods of treatment of cancer and allied conditions.

A report upon the results of treatment of cases received before January 1, 1916, was made in April, 1917, to the Boston Surgical Society, and the substance of the series of papers there presented was given at a meeting of the Massachusetts Medical Society in June, 1917. These papers have been published in the Boston Medical and Surgical Journal, and appear in the list of the Commission's publications.

A conservative view of the value of radium in the treatment of cancer appears to justify the continuance of its use in certain limited groups of cases, while making it desirable that improved and more effective methods of application be devised for its use in the treatment of other forms of cancer which, as yet, have shown little if any susceptibility to favorable action.

(Signed) ROBERT B. GREENOUGH.

REPORT OF THE SURGEON IN CHARGE OF THE COLLIS P. HUNTINGTON MEMORIAL HOSPITAL

TO THE

CANCER COMMISSION OF HARVARD UNIVERSITY.

GENTLEMEN: The work of the Huntington Hospital continued during 1916–1917, with the following staff: Dr. Robert B. Greenough, Surgeon in Charge; Dr. Edward H. Risley, Assistant Surgeon; Dr. Henry A. Christian and Dr. Francis W. Peabody, Consulting Physicians; Dr. George A. Leland, Jr., Surgeon to Out-patients; Dr. George Benet, Resident Surgeon; Mr. Ernest W. Daland, House Officer; Miss Irene W. Mason, Matron, resigned in January, 1917, and Miss Anna L. Gibson, formerly Assistant Matron, was appointed Matron. In November, 1916, Dr. Channing C. Simmons was appointed Assistant Surgeon, and Dr. D. Crosby Greene, Consulting Laryngologist.

Dr. Francis W. Peabody went on a Red Cross mission to Roumania in May, 1917, and his work with the leukemia cases was taken up by Dr. George R. Minot, assisted by Dr. Gerald Blake.

During Dr. Greene's illness in May and June, 1917, Dr. Harry A. Barnes volunteered to take on Dr. Greene's work.

Dr. George Benet, resident surgeon, resigned in May, 1917, took service in a London hospital, and subsequently joined the U.S.A. Medical Reserve Corps, for service in France.

Dr. George A. Leland, Jr., left in June, 1917, as a member of the Medical Reserve Corps, U.S.A., and went to France.

The Surgeon in Charge, Dr. Robert B. Greenough, was also called to active duty in the Naval Medical Reserve Corps, in April, 1917, at the U.S. Naval Hospital in Chelsea, but has been able up to the present time to continue also his work for the Commission.

In spite of this number of men in active service, the work of the hospital has been carried on, and none of its activities has been seriously curtailed. The coöperation with the different departments of the Medical School of Harvard University has been maintained, and many members of the different clinical and laboratory departments have given their services in consultation.

Dr. F. L. Richardson and Dr. Lincoln Sise have aided in the work of the hospital by giving anesthesia in a number of cases.

The X-ray work of the hospital has been interrupted while waiting the completion of the high-powered apparatus now under construction. Such work as is needed has been done by Dr. L. B. Morrison, at his office, as it had been done before by Dr. W. J. Dodd.

During the fiscal year, from July 1, 1916, to July 1, 1917, there were 571 new cases brought to the hospital, as contrasting with 508 in 1916, and 417 in 1914–1915; 346 cases were admitted to the house, and 805 cases were treated in the Out-patient Department. This represents a material increase in the total number of new cases, especially in the Out-patient Department, for the In-patient Department has, for some time, been filled nearly to its utmost capacity. Further physical accommodations for the growing Out-patient clinic are urgently needed.

The number of new cases, the number of in-patient days, and the number of out-patient days are given in the following table:

Year.	Number of Patients.	O. P. D. Visits.	In-patient Days.	Operating Expenses.	Total Hospital Earnings.
1912–1913*	190	482	5,372	$23,358.41	$4,053.19
1913–1914	360	1,634	5,529	26,115.62	4,607.72
1914–1915	509	3,676	5,725	25,278.78	9,811.08
1915–1916	508†	3,833	6,118	26,888.36	13,078.08
1916–1917	571†	4,488	6,602	29,266.00	15,176.46

* 14 months. † New patients only.

Cases of all kinds of cancer, and of other diseases occasionally mistaken for cancer, are referred to the hospital for disposition. Many cases, however, come to us only in the terminal stages of the disease, when little can be done to alleviate their suffering. The hospital could be filled three or four times over by worthy patients in this advanced stage of the disease in need of hospital care, but without resources with which such care can be procured. There is urgent need for a greater number of hospital beds in the community to accommodate these cases. It is to be hoped, however, that this want may be met by the construction of additional hospitals for this purpose, as no larger proportion of the total number of beds in the Huntington Hospital can be devoted to cases of this character without curtailing seriously the accommodation for transient cases, which now come to the hospital at intervals and for brief periods to receive treatment with radium.

Continuing the method of publication of the statistics of the hospital begun in 1915, the following table is arranged according to the Classification of Diseases of the Massachusetts General Hospital, and based upon the numbers of the International List of Causes of Death. The cases observed and treated in the house and Out-patient Department, classified as to disease and sex, are given in the following table. All of the 571 patients in this year's report were new patients as against 508 new patients in 1915–1916.

	Male.	Female.	Total.
CARCINOMA . . . . . A.			
Buccal Cavity . . . . . 39A.			
Lip 7-2-39A-1	20	2	22
Palate 7-2-39A-3	9	0	9
Jaw — lower 7-2-39A-5	15	1	16
Tongue and floor 7-2-39A-9	39	2	41
Tonsil 7-2-39A-10	9	0	9
Antrum and upper jaw 7-2-30A-12	6	1	7
Total . . . . . 39A . .	98	6	104
Stomach and Liver . . . . . 40A.			
Esophagus 7-7-40A-3	4	1	5
Pharynx 7-7-40A-4	3	2	5
Stomach 7-7-40A-5	4	1	5
Naso-pharynx 7-7-40A-7	2	0	2
Total . . . . . 40A . .	13	4	17
Peritoneum, etc. . . . . 41A.			
Intestines 7-13-41A-1	3	2	5
Rectum 7-13-41A-2	4	7	11
Peritoneum 7-13-41A-3	1	0	1
Total . . . . . 41A . .	8	9	17
Urinary Organs . . . . . 45A.			
Bladder 7-19-45A-3	5	2	7
Urethra 7-19-45A-4	0	1	1
Total . . . . . 45A . .	5	3	8

NOTE: This table is arranged according to the Classification of Diseases of the Massachusetts General Hospital, which is based on the numbers of the International List of Causes of Death.

In the table the first two numbers have reference to the Massachusetts General Hospital Classification; the last number has reference to the International List. Thus, 7–2–39A indicates Section VII., No. 2, of the Massachusetts General Hospital Classification, and 39A indicates carcinoma of the buccal cavity, on the International List. The different sites of cancer in the buccal cavity are indicated by sub-divisions — 39A–1 for lip; 39A–3 for palate, etc.

	Male.	Female.	Total.
CARCINOMA (*Continued*) . . . . . A.			
G-U Male . . . . . 45A.			
Prostate 7-25-45A-5	5	0	5
Penis 7-25-45A-6	2	0	2
Total . . . . . 45A . .	7	0	7
G-U Female . . . . . 42A.			
Vulva 7-31-42A-1	0	7	7
Vagina 7-31-42A-2	0	6	6
Cervix 7-31-42A-3	0	45	45
Uterus 7-31-42A-4	0	9	9
Ovary 7-31-42A-5	0	2	2
Total . . . . . 42A . .	0	69	69
Breast . . . . . 7-39-43A.	1	45	46
Skin . . . . . 44A.			
Face 7-44-44A-1	12	10	22
Nose 7-44-44A-2	14	11	25
Eyelid 7-44-44A-3	14	9	23
Ear 7-44-44A-4	9	2	11
Scalp 7-44-44A-5	0	2	2
Forehead 7-44-44A-6	5	4	9
Total . . . . . 44A . .	54	38	92
Other Sites. . . . . 45A.			
Neck 7-49-45A-9	4	4	8
Larynx 7-49-45A-10	8	2	10
Thyroid 7-49-45A-12	1	2	3
Hand 7-49-45A-15	2	0	2
Arm 7-49-45A-21	0	1	1
Leg 7-49-45A-16	1	0	1
Foot 7-49-45A-17	1	0	1
Orbit 7-49-45A-22	1	0	1
Eyeball 7-49-45A-23	1	0	1
Pancreas 7-49-45A-20	0	1	1
Nasal passages 7-49-45A-11	1	1	2
Total . . . . . 45A . .	20	11	31

	Male.	Female.	Total.
SARCOMA . . . . . F.			
Jaw 7-4-39F-5	4	0	4
Tonsil 7-4-39F-10	1	0	1
Nose 7-61-45F-1	0	1	1
Naso-pharynx 7-10-40F-7	0	1	1
Larynx 7-61-45F-2	0	2	2
Neck 7-52-45F-9	1	0	1
Breast . . . . . 7-48-43F.	0	1	1
Chest 7-61-45F-3	0	1	1
Mediastinum 7-61-45F-4	1	0	1
Abdominal wall . . . . . 7-19-41F.	1	0	1
Spleen 7-61-45F-5	0	1	1
Retro-peritoneal 7-16-41F-7	1	0	1
Testicle 7-28-45F-7	1	0	1
Ilium 7-52-45F-6	1	0	1
Leg 7-52-45F-17	1	0	1
Femur 7-52-45F-6	1	0	1
Melanotic 7-52-45F-15	5	4	9
Total . . . . . F. .	18	11	29
MALIGNANT LYMPHOMA . . . . 7-53-53L.			
Hodgkin's disease type	6	3	9
Lymphoma	4	2	6
Lympho-sarcoma	1	1	2
Total	11	6	17
MIXED TUMOR . . . . . G.			
Parotid . . . . . 7-54-45G. .	4	1	5
GLIOMA 7-79-46			
Brain	0	1	1
Sacrum	1	0	1
Total	1	1	2

	Male.	Female.	Total.
NON-MALIGNANT TUMORS:			
Keloid 7-56-46	3	3	6
Cystic disease, breast 37-88-183	. . . . .	2	2
Cyst adenoma, breast 7-61-133	. . . . .	1	1
Cyst adenoma, ovary 7-60-131	. . . . .	2	2
Angioma 7-62-46	2	1	3
Angioma (nevus) 10-109-150	1	1	2
Lymphangioma 7-74-46	. . . . .	2	2
Papilloma 7-80-46	4	3	7
Verruca 10-140-145	1	1	2
Fibromyoma, uterus 7-71-129	. . . . .	6	6
Lipoma 7-74-46	. . . . .	2	2
Cyst 7-65-46	1	1	2
Naso-pharyngeal fibroma 7-70-46	1	. . . . .	1
Hemangio-endothelioma ilium 7-50-45B	. . . . .	1	1
Adeno-fibroma, vaginal vault 7-57-46	. . . . .	1	1
Total	13	27	40
OTHER CONDITIONS:			
Lupus vulgaris 1-87-34	. . . . .	1	1
Syphilis 1-100-37	3	2	5
Keratosis senilis 10-84-145	14	10	24
No diagnosis 39-19-189	1	6	7
No disease (apprehension) 39-20-139	3	4	7
Lupus erythematosus 10-95-145	. . . . .	1	1
Acne rosacea 10-128-145	1	. . . . .	1
Nævus pigmentosus 10-106-150	. . . . .	2	2
Rhino-scleroma 18-17-86	. . . . .	1	1
Sycosis 10-134-145	1	. . . . .	1
Furunculosis 9-16-143	. . . . .	1	1
Impetigo contagiosa 10-78-145	. . . . .	1	1
Leucoplakia 21-5-99	6	. . . . .	6
Aleukemic leukemia 13-5-53	. . . . .	1	1
Lymphatic leukemia 13-6-54	2	. . . . .	2
Myelogenous leukemia 13-7-54	7	4	11
Polycythemia 13-8-55	. . . . .	1	1
Chronic endometritis 37-26-130	. . . . .	1	1
Enlarged thyroid 7-57-88	. . . . .	1	1
Carried forward	38	37	75

	Male.	Female.	Total.
OTHER CONDITIONS (*Continued*):			
Brought forward	38	37	75
Tubercular adenitis . . . 1-89-34	. . . . .	1	1
Tubercular tongue . . . 1-95-34	1	. . . . .	1
Tubercular nasal septum . . . 1-77-34	. . . . .	1	1
Cicatrices . . . 10-27-145	. . . . .	1	1
Chronic inflammation . . . 9-54-145	1	1	2
Granuloma . . . 1-150-145	. . . . .	1	1
Cholelithiasis . . . 25-6-114	. . . . .	1	1
X-ray burn . . . 9-1-167	1	. . . . .	1
Total	41	43	84

SUMMARY.

	Male.	Female.	Total.
CARCINOMA:			
Buccal cavity . . . 39A	98	6	104
Stomach and liver . . . 40A	13	4	17
Peritoneum, etc. . . . 41A	8	9	17
Urinary organs . . . 45A	5	3	8
G-U male . . . 45A	7	0	7
G-U female . . . 42A	0	69	69
Breast . . . 43A	1	45	46
Skin . . . 44A	54	38	92
Other sites . . . 45A	20	11	31
Total carcinoma	206	185	391
Carcinoma	206	185	391
Sarcoma	18	11	29
Malignant lymphoma	11	6	17
Mixed tumor	4	1	5
Glioma	1	1	2
Non-malignant tumors	13	27	40
Other conditions	41	43	84
Total	294	274	568

Numbers were not given to 3 patients	3
	568
Total	571

One hundred and sixteen cases were given surgical operative treatment in the hospital during the year. These were, for the most part, minor operations involving excision of tumor tissue, cauterization, the removal of carcinomatous lymph nodes, curettage for carcinoma of the cervix, and emergency operations, such as tracheotomies and transfusion. The combination of operative treatment and radium therapy has proved useful in many cases of advanced cancer.

The follow-up system to obtain data with regard to the end-results of cases has been carried on by Miss Ruth Symonds in a most effective fashion. Letters are sent to all patients who do not report in person or by letter every six months, and the percentage of cases in which an end-result is not obtainable is extremely small.

The general policy of the hospital in regard to radiotherapy continues as detailed in the last report. Every patient coming to the hospital is examined by one of the surgical staff with reference: first, to the diagnosis, and second, to the propriety of radium treatment in the individual case. If radium therapy is indicated, the case is seen in consultation with Dr. Duane, and the details of treatment determined with due regard to the clinical aspects of the case, as well as to the physical principles involved. Treatment is then continued, and the case is brought up for review by the staff from time to time, as changes in the condition may arise. By this method of procedure it is believed that the interest of the individual patient is safeguarded and the greatest efficiency in the application of radiotherapy is obtained.

During the year thirty-four deaths occurred in the hospital, and in twenty-eight of these cases autopsies were obtained. It is the policy of the hospital to require, in advance, permission for autopsy in all cases in the terminal stages of their disease that are accepted for permanent care. In certain instances, however, it has been impossible to maintain this rule, and the percentage of autopsies has therefore suffered.

The administration of the hospital under Miss Irene W. Mason was in every way efficient and satisfactory. Miss

Mason resigned in January, 1917, to take a position, in another hospital, of greater responsibility. Miss Anna L. Gibson was then appointed matron, and her administration has been economical and effective. Miss Myra Conover has assumed many of Miss Gibson's former duties, and has performed them most satisfactorily, especially in relation to the laboratory course for nurses. The course for the laboratory training of nurses, which was developed by Miss Gibson, has been most successful and appears to fill a real want in the community. It is believed that this course contributes in no small part to the successful operation of the hospital.

To all the members of the nursing and housekeeping staff, as well as to the surgical staff of the hospital, the consulting physicians, the treasurer, and the other members of the Commission, and to the many friends of the hospital, the credit for a satisfactory year's work is due.

Respectfully submitted,

(Signed) ROBERT B. GREENOUGH.

REPORT OF THE MATRON

TO THE

SECRETARY OF THE CANCER COMMISSION OF HARVARD UNIVERSITY.

DEAR SIR: I have the honor to present the following report:

The increasing number of patients referred to our clinic for diagnosis and treatment, and the many inquiries concerning cancer research, show that the hospital is filling a definite need in the community. The service which the hospital is rendering is demonstrated in the statistical table for the year which shows 805 out-patient cases treated — an increase of 234 over the previous year.

We have increased materially the amount of our free, semi-free, and cost service. In spite of the rapidly rising cost of food, drugs, and housekeeping supplies, the rates to patients have not been increased. The average cost of food per patient and employee per day amounted to fifty-four cents — a decrease of one cent in comparison with last year. Strict economy has been practised in all departments.

The small vegetable garden has furnished many fresh vegetables for the hospital. The sum of six dollars was expended for garden implements and seeds, and the produce grown in the garden amounted to thirty-five dollars. It seems advisable that more land be under cultivation next year.

An effort is being made to establish a Reference Library for Cancer Research. Several books have been received, also many pamphlets from the American Society for Cancer Research. Many inquiries have been made by physicians and the laity for literature on this subject, and an opportunity is given to consult these books and view the collection of photographs illustrating the various types of cancer.

Six students have completed the course in Clinical Laboratory Technic, and are engaged in this work. Two are with the Harvard Unit in France, and one at Dr. Joseph Blake's hospital in Paris.

The following information is given on printed cards, which are supplied to the larger hospitals, and can be sent on request to physicians and to patients:

ADMISSION OF PATIENTS.

Application for examination of patients may be made at the hospital, corner of Huntington Avenue and Van Dyke Street, on the following days, and should be accompanied by a written description of the case by the attending physician.

Monday	2–4 P.M.	Nose and Throat Cases.
Tuesday	2–4 P.M.	General Surgical Cases.
Wednesday	2–4 P.M.	Leukemia Cases.
Thursday	2–4 P.M.	Lymphoma and Sarcoma Cases.
Friday	2–4 P.M.	General Surgical Cases.

House cases received only by appointment. Board in wards is fifteen dollars per week. Board in the private rooms, twenty-five, thirty-five, and fifty dollars per week. The hospital has a limited number of free beds, in open wards, supported by private donations.

The following Huntington Avenue cars pass the door of the hospital:

From the Subway at Park Street:
South Huntington Avenue–Jamaica Plain. Brookline Village via Huntington Avenue.

From Park Square:
Worcester.

The Brookline Village–Dudley Street cars pass the corner of Huntington Avenue and Tremont Street, only a short distance from the hospital.

Appreciation of the kindness of many friends should be expressed for books, flowers, periodicals, fruit and vegetables, which have been given to the hospital. Special mention should be made of the beautiful American Flag and flag-pole, which was presented to the hospital, April 3, 1917, by General Charles L. Peirson.

List of Gifts.

The American Flag: General Charles L. Peirson.

Books and Magazines: Dr. J. Collins Warren, Dr. Channing C. Simmons, Dr. E. H. Risley, Mrs. Mary Burns.

Flowers: Mrs. Moses Williams, Mrs. Channing C. Simmons, Mrs. C. M. Weld, Mrs. Roland C. Thorpe, Mr. Charles Gummo, Dr. Herbert Boss, Mrs. Mary Kendall.

Vegetables: Dr. Channing C. Simmons, Mrs. Mary Kendall, Mrs. C. C. Little.

Fruit: Mrs. Moses Williams, Mrs. Mary Kendall.

To the nurses and employees of the institution I would express my grateful appreciation for their devoted service and coöperation in realizing the importance and necessity of conserving the food, drugs, and housekeeping supplies.

(Signed) Anna L. Gibson.

REPORT OF THE RESEARCH FELLOW IN PHYSICS

TO THE

CANCER COMMISSION OF HARVARD UNIVERSITY.

WILLIAM DUANE, PH.D.

GENTLEMEN: A large part of the writer's time has been taken up with the actual radium treatments. On the average about forty-eight patients per week have been seen. Most of the tumors treated belong to the superficial types of skin cancer, in which radium produces the greatest benefit. The treatment of these cases requires a considerable knowledge of the science of radio-activity, especially of the quantitative laws used in estimating dosage, filtration, etc.

The research work that has been carried on deals to a considerable extent with the problem of producing artificially, by means of X-rays, intense radiation that approaches in penetration the gamma rays of radium. The fact that no one has succeeded in actually doing this indicates the difficulty of the problem. We have found out, however, the general laws according to which certain things must be done in order to generate rays of the required penetration; and the General Electric Company is constructing an X-ray plant which (it is confidently expected) will produce rays sufficiently intensive and penetrating.

We have found that the following three laws represent the facts as far as we have been able to test them with the high potential battery in the Jefferson Physical Laboratory:

First law: The penetration of the rays through a substance varies as the cube of the frequency of vibration of the rays. This law holds except in the neighborhood of what are called the characteristic frequencies of the chemical elements in the substances.

There are two kinds of X-rays generated in a tube, namely: the general and the characteristic rays.

Second law: We have found that the maximum frequency of the general radiation depends only upon the voltage applied to the tube and is given by the equation

$$\text{Frequency} = \frac{e}{h} V$$

where "e" and "h" are well-known physical constants, and V is the voltage applied to the tube. This law appears to be exact.

Third law: The frequencies of the characteristic radiation depend upon the nature of the substance that is used as the anti-cathode in the X-ray tube. The equation that gives the highest of these frequencies may be written $\nu = \nu_0 (N - 3\frac{1}{2})^2$ in which ν_0 is a physical constant used in spectrum analysis, and N is the atomic number of the chemical element composing the anti-cathode. (The atomic number of an element is the position it occupies in the sequence of the chemical elements, counting hydrogen as one.) This law appears to be an approximation to the truth, but gives the frequency to within less than one per cent over the range examined.

Articles have been published recently on the following subjects:

1. "A Reactive Modification of Hydrogen Produced by Alpha Radiation."[1] This research proves that the chemical reactions taking place under the influence of the rays are not always those recorded in classical chemistry. The possibility of explaining the action of the rays on the tissues may have to be sought for outside of the established modes of reaction.

2. "Value of the Constant h Determined by Means of X-rays."[2]

3. "High Frequency Absorption Spectra of the Chemical Element."[3] It appears that a sharp increase in the absorption of X-rays occurs above the frequencies given by the third of the above laws.

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[1] Physical Review, August, 1917: William Duane and Gerald L. Wendt.
[2] Physical Review, December, 1917: F. C. Blake and William Duane.
[3] Physical Review, December, 1917: F. C. Blake and William Duane.

4. "Radium in the Treatment of Cancer."[4] It would seem as a result of this research that in certain types of cases prolonged radiation with very small intensity produced better results than short treatments with intensive radiation.

5. "Methods of Preparing and Using Radio-active Substances in the Treatment of Malignant Diseases and of Estimating Suitable Dosages."[5] This article contains a more or less detailed statement of the methods we have developed during the last four years.

Other researches on these and similar problems are in progress.

The following gentlemen have assisted in carrying on the work: Mr. Hunt, Mr. Wendt, Mr. Hu, Mr. Miller, Mr. Shimizu, and Mr. Blake. Mr. Webster and Mr. Clark also have carried on researches independently along the above general lines. All of these gentlemen have finished their undergraduate training, and in most cases have taken degrees higher than the A.B. degree. Those of them who have not taken the Ph.D. degree are now working for it. Mr. Blake holds a full professorship in the State University of Ohio, and has been spending a sabbatical year's leave of absence in Cambridge.

In addition to the uses previously described, the radium plant has furnished emanation to men working along other lines. Among these I would like to note the research of Mr. Redfield, who has been working in Dr. Alexander Forbes' laboratory. Mr. Redfield has found that the fertilization membranes of certain eggs become abnormally thick if the eggs have been radiated. He has made this increase of volume the basis of quantitative measurements of the physiological effects of the rays. He also examined the question as to whether weak radiation acting for a longer time produced greater results than intensive radiation acting for a shorter time. It appears that over a certain range of values very little difference between the two cases exists,

[4] Proceedings of the Second Pan-American Scientific Congress, Vol. X., p. 503: William Duane.

[5] The Boston Medical and Surgical Journal, December 6, 1917: William Duane.

provided that the product of the time into the intensity of radiation is kept constant, but that when the quantities are changed in a large ratio, the weak radiations for a longer time produce the greater effect.

During the past year a chair of bio-physics has been created in the Department of Physics at Harvard College. The work represented by this chair is carried on in close coöperation with the Cancer Commission.

At the request of the Chairman of the Commission, the writer consulted the architects last spring about drawing up plans for a new building, to be placed alongside of the hospital, the idea being that the building should contain the radium and X-ray plants. It appears to be wiser for the purposes of radiotherapy that these two activities should be carried on in close proximity to the hospital, rather than in the Medical School. In general, however, it is quite possible that scientific research can be carried on to better advantage in large buildings than in small ones.

(Signed) WILLIAM DUANE.

REPORT OF THE RESEARCH FELLOW IN PHYSICS TO THE CANCER COMMISSION OF HARVARD UNIVERSITY.

W. T. Bovie, Ph.D.

Gentlemen: I have the honor to submit to you the following brief report of my work for the year 1916–1917:

The work in this laboratory has followed the same general lines as that of last year, namely: investigations on the nature of the biological action of radiation. It may be advisable to state the purpose of these studies and to indicate their relation to the clinical work of the hospital.

The purpose of the investigations. — The previous investigations upon the biological effects of radiation have been confined largely to the visible changes, both microscopic and macroscopic, which may be observed in normal and abnormal tissues subsequent to radiation. A great deal of information has been gained in this manner. It has seemed to me, however, profitable to make quantitative studies of changes in certain physiological processes in tissues subsequent to radiation. Such a line of attack is certain to yield new kinds of information. It is desirable to study physiological changes which are the direct result of the radiation and which are little influenced by the secondary reactions of the organism. For this reason it is expedient to use such methods, kinds of radiation, and biological material as will yield the greatest amount of the particular kind of information sought.

The investigation must be conducted quite independent of the immediate clinical application, in order to avoid needless limitations. The value of the results is to be judged by the yield of information concerning the mechanism of the physi-

ological action of radiation. It is believed that only by accumulating facts by such methods as these will it be possible to arrive at a true theory of the nature of the therapeutic action of rays. The ultimate usefulness of information of this kind will undoubtedly be conceded by all.

While the experimental work has been outlined quite independent of clinical problems, nevertheless I believe it is essential that the biologist be acquainted with both the physician's problems and his results, not only that the biological investigations may be oriented so as to give information most useful to the clinician, but also in order that the facts learned by the clinician may be available to the biologist.

CHANGES IN THE PERMEABILITY OF PROTOPLASM CAUSED BY RADIATION. — Previous investigators have shown the permeability of protoplasm to be a very delicate index of its physiological tone, and further that changes in permeability occur long before visible changes are manifest. A method has been developed for quantitatively following the permeability changes resulting from radiation by observing variations in the resistance of the protoplasm to the passage of an electric current. It is possible by this method to follow the changes both during and after radiation. Up to the present time about ten thousand permeability measurements have been made. A number of new facts concerning the physiological action of radiation have been disclosed. First, it has been possible to divide the changes caused by radiation into two distinct categories: one is the direct result of the radiation and the other is a catenary of changes resulting from the initial change. The catenary of changes resulting from the initial change continues after the exposure, and proceeds at a rate which is more or less proportional to the amount of radiation.

ARE THE EFFECTS PRODUCED BY RADIATION PROPORTIONAL TO THE INTENSITY AND TO THE LENGTH OF EXPOSURE? — According to a photochemical law, first announced by Talbot, the amount of photochemical change is

proportional to the intensity of the light times the length of exposure. Later, Bunsen and Roscoe confirmed this law for certain photochemical reactions. It should be pointed out, however, that as a matter of fact but very few of the known photochemical reactions follow this law. For example, Talbot's law applies to the human eye only under the conditions obtained by a flicker photometer, for the element of time is not involved in vision in the ordinary sense because the eye does not possess the property of accumulating intensity. Further, it is by no means a simple matter to define the physiological intensity of mixed radiations, and even if the amount of the initial photochemical change is proportional to the intensity of radiation times the length of exposure, it by no means follows that the observed physiological effect will have this same proportionality.

An examination of the permeability readings discloses the fact that at constant temperatures the rate of change produced by radiation is in general proportional to the intensity times the length of exposure, but that there is considerable variation in the susceptibility of different specimens of tissue. The total amount of change does not appear to follow Talbot's law. The experiments, however, were not especially designed for determinations of the total effect produced.

THE INFLUENCE OF TEMPERATURE UPON THE EFFECTS PRODUCED BY RADIATION. — It has been found that the rate of permeability change is greatly increased by increasing the temperature, either during or after radiation. That is, tissues which have been radiated are sensitized to heat so that they are destroyed by degrees of temperature which do not affect normal tissues. These results are particularly important because of their analogy to the results of my previous studies upon the relationship between temperature and the photocoagulation of proteins. A consideration of these analogies has given information concerning the nature of the initial change produced by radiation, and I believe it is now possible to formulate a theory of the nature of the physiological effect.

THE INFLUENCE OF RADIATION UPON THE RATE OF CELL DIVISION. — According to a theory, due originally to Ehrlich, and later supported by v. Wasserman and by Halberstadter, radiation destroys the "gemoceptors" of the cell, but does not injure the "neutroceptors." According to this theory, the selective action which certain rays seem to have for cancerous tissue is due to the fact that cancer tissue cells are rapidly dividing. The validity of the theory is of considerable importance and a number of investigators have attempted to test it by using tissue cultures. The experiments have failed because the technic of tissue culture is difficult and because it is impossible to assign quantitative values to the results obtained. I have, therefore, tested the theory by using pedigreed cultures of Paramecium. A large number of organisms have been exposed to Schumann radiation, and the subsequent rate of cell division for each organism followed for about a month after the exposure. A comparison of the rate of cell division in radiated animals with that of controls disclosed no indication of a reduction in the ability of the cells to divide. In other words, organisms which did not die within a few hours after radiation showed no change in division rate.

RECOVERY FROM RADIATION. — The results of these experiments are in harmony with the experiments on the influence of radiation upon the rate of cell division. In these experiments the length of exposure to a given intensity of Schumann radiation necessary to kill approximately fifty per cent of the individuals of a pedigreed race of Paramecium was determined. This is called the unit dose. Other individuals were then given a number of sub-lethal doses, at different intervals of time, so that the total exposure given was equal to a lethal dose. It was found that an organism can recover from a half lethal dose in one hour so that a second half lethal dose does not kill. The experiments are of importance because it is believed that when they are followed out in more detail it will be possible to arrive at conclusions concerning the nature of the process of the recovery of protoplasm from the effects of radiation.

THE EFFECTS OF TEMPERATURE UPON THE AFTER EFFECTS RESULTING FROM SCHUMANN RADIATION. — Standardized races of Paramecium were used for these experiments. Paramecium which had been subjected to sub-lethal doses of Schumann rays were found to be sensitized to heat, so that they were destroyed by degrees of temperature which had no ill effects on normal individuals. The results are similar to those obtained by the permeability experiments.

THE EFFECT OF ULTRA VIOLET LIGHT ON GELATIN. — It has been found that gelatin loses its ability to form a jell by exposure to ultra violet radiation. This fact is significant in connection with the photocoagulation of proteins because it shows that the photochemical changes resulting from exposing proteins to the light has a marked effect upon their degree of hydration. This is undoubtedly the cause of some of the visible changes which may be observed in radiated protoplasm.

The details of the various investigations, outlined above, will be found in forthcoming publications. From the results of the work to date, I believe that it is possible to arrive at quite definite notions concerning the nature of the physiological effects of radiation. Space does not permit a discussion in this report.

(Signed) W. T. BOVIE.

REPORT OF THE RESEARCH FELLOW IN GENETICS

TO THE

CANCER COMMISSION OF HARVARD UNIVERSITY.

C. C. Little, S.D.

Gentlemen: During the past year, up to and including June 20, 1917, the following lines of work have been carried on with relatively satisfactory results:

1. The production of deciduoma in the uterus of a rat after the implantation of macerated embryonic chick tissue.
2. The persistence and differentiation for nine days of cartilagenous embryonic chick tissue under the skin of mice.
3. Evidence that the uterus of female mice, insusceptible to subcutaneous implants of a given tumor, is not a favorable field for tumor growth, even though inoculated at a period following gestation, which made certain that the uterus was in a receptive condition.
4. Evidence that certain of the hereditary factors producing immunity to inoculated tumors of the Japanese Waltzing Mouse are developed after the birth of the young.

The last two named lines of investigation are of considerable interest in possibly opening the way to experimental analysis of such hereditary factors influencing tumor growth as develop after the birth of the individual.

The first two lines of investigation, especially the second, have an important bearing on the biological nature of embryonic tissue of foreign species. It tends to show that the relation between embryonic and maternal tissue in mammals is one of tolerance on the part of the maternal host to an implant of tissue which, because of its undifferentiated nature, lacks the elements which are necessary to call forth an antagonistic reaction on the part of the host. This is quite different from the conception of embryonic tissue which would hold that it was identical in nature with the maternal tissue.

(Signed) C. C. Little.

REPORT OF THE TREASURER

TO THE

CANCER COMMISSION OF HARVARD UNIVERSITY.

ARTHUR ADAMS.

GENTLEMEN: I have the honor to submit to you my report for the year ending June 30, 1917.

Contributions to the funds of the Cancer Commission have been received by the Treasurer of Harvard College, from July 1, 1916, to June 30, 1917, amounting to $76,555.00. $68,898.90 of this amount was available for current expenses and immediate use, and $7,656.10 was added to the invested funds.

On the books of the Treasurer of Harvard College, July 1, 1917, the following special funds were listed, the income of which was available for the Cancer Commission of Harvard University:

Cancer Hospital Endowment Fund	$131,513.51
Caroline Brewer Croft Fund	92,025.00
Emily J. Proctor Gift	2,500.51
Francis Bartlett Free Bed Fund	5,000.00
L. C. Fenno Free Bed Fund	5,000.00
F. H. Hooper Free Bed Fund	5,000.00
A. L. Hopkins Free Bed Fund	5,000.00
C. E. Payson Free Bed Fund	5,000.00
Maria D. Lockwood Memorial Fund	50,728.58
*Cancer Hospital Proctor Maintenance Fund	9,056.97
L. C. Fenno Memorial — Treatment by Light Rays	20,000.00
*Memorial Cancer Hospital Research Fund	11,058.99
T. Jefferson Coolidge Fund for Cancer Research	2,000.00
Julia M. Moseley Fund	23,250.00
William Endicott Fund	25,000.00
*Memorial Cancer Hospital — New Laboratory Fund	10,000.00
*Gift for Research in Genetics	320.00
*Gift for Salary, 1916–1917	1,000.00
	$403,453.56

* Entire gift available for current expenses.

This amount is to be compared with the total of $395,797.46 in last year's report, showing a net increase in the invested funds of the Commission of $7,656.10 during the year 1916–1917.

The list of subscribers to the funds of the Cancer Commission in 1916–1917 is as follows:

GIFTS TO CAPITAL FUNDS.

New Laboratory Fund:		
Anonymous	$5,000.00	
Redfield Proctor	5,000.00	
		$10,000.00

MEMORIAL CANCER HOSPITAL RESEARCH FUND (LABORATORY FUND).

Anonymous	$5,000.00	
Robert K. Cassatt	100.00	
Alexander Cochrane	250.00	
A friend	250.00	
Henry S. Howe	100.00	
Charles C. Jackson	100.00	
Frederic Parker	50.00	
James A. Stillman	50.00	
		5,900.00

GIFTS FOR IMMEDIATE USE.

For the Purchase of Radium:		
Anonymous	$45,000.00	
Miss Emily Dutton Proctor	500.00	
		45,500.00
Salaries:		
Anonymous		1,000.00
Collis P. Huntington Memorial Hospital:		
Current expenses:		
George R. Agassiz	$250.00	
Miss Martha A. Alford	100.00	
F. Lothrop Ames	100.00	
Anonymous	1,000.00	
Anonymous	25.00	
Anonymous	50.00	
Nelson S. Bartlett	25.00	
Mrs. Walter C. Baylies	200.00	
William Sturgis Bigelow	100.00	
Mrs. Wilmon W. Blackmar	25.00	
Mrs. Arthur W. Blake	20.00	
Carried forward,	$1,895.00	$62,400.00

Brought forward,	$1,895.00	$62,400.00
Mrs. Francis Blake	20.00	
Mrs. Edward D. Brandegee	100.00	
Miss Sarah F. Bremer	50.00	
Miss Fannie R. Brewer	25.00	
Miss Katherine E. Bullard	50.00	
Mrs. John A. Burnham	10.00	
I. Tucker Burr	25.00	
"E. S. C."	100.00	
Mrs. Arthur Tracy Cabot	50.00	
Godfrey L. Cabot	100.00	
Arthur A. Carey	5.00	
Miss Emma F. Cary	25.00	
Miss Georgina S. Cary	25.00	
Mrs. Theodore Chase	25.00	
Herbert L. Clark	50.00	
Mrs. Costello C. Converse	200.00	
Charles E. Cotting	100.00	
W. Murray Crane	200.00	
Mrs. Francis B. Crowninshield	10.00	
John S. Curtis	50.00	
Philip Y. DeNormandie	25.00	
John W. Farlow	25.00	
Frederick P. Fish	50.00	
Henry C. Frick	250.00	
Mrs. Louis A. Frothingham	200.00	
Miss Harriet Gray	25.00	
Robert B. Greenough	10.00	
Mrs. Henry S. Grew	50.00	
Miss Ellen R. Hathaway	100.00	
Horatio Hathaway, Jr.	10.00	
Mrs. Malcolm G. Haughton	100.00	
Augustus Hemenway	100.00	
The Misses Holt	50.00	
William Hooper	50.00	
Miss Elizabeth G. Houghton	25.00	
Mrs. Charles W. Hubbard	50.00	
Humane Society of the Commonwealth of Massachusetts	1,000.00	
Henry S. Hunnewell	100.00	
Walter Hunnewell	100.00	
Mrs. Henry E. Huntington	2,000.00	
Henry Jackson	20.00	
George Abbot James	20.00	
Edward C. Johnson	20.00	
A. Paul Keith	25.00	
Ellis Kellert	5.00	
Carried forward,	$7,525.00	$62,400.00

Brought forward,	$7,525.00	$62,400.00
David P. Kimball	50.00	
The Misses Kimball	25.00	
Mrs. Henry P. King	200.00	
Thomas W. Lamont	250.00	
Mrs. Gardiner M. Lane	50.00	
Lawrence Model Lodging Houses	500.00	
George V. Leverett	100.00	
Augustus P. Loring and Mrs. Loring	50.00	
Mrs. William Caleb Loring	10.00	
Edward Mallinckrodt, Jr.	100.00	
Mrs. Charles E. Mason	100.00	
Miss Ida M. Mason	50.00	
J. Ewing Mears	25.00	
Mrs. Daniel Merriman	25.00	
The Misses Morrill	75.00	
William H. O'Connell	20.00	
Henry J. O'Hara	5.00	
Mrs. Robert Treat Paine, 2d	25.00	
William A. Paine	200.00	
Miss Eleanor S. Parker	25.00	
John Parkinson	50.00	
George A. Peabody	500.00	
Wallace L. Pierce	100.00	
David Pingree	200.00	
Mrs. Alexander S. Porter, Jr.	25.00	
Miss Emma Rodman	25.00	
Miss Annette P. Rogers	15.00	
Mrs. Jacob C. Rogers	100.00	
William L. Richardson	100.00	
Mrs. Robert S. Russell	25.00	
John L. Saltonstall	100.00	
Mrs. Francis W. Sargent	25.00	
Mrs. J. Montgomery Sears	100.00	
Mrs. Knyvet W. Sears	100.00	
Mrs. Quincy A. Shaw	100.00	
Francis P. Sprague	100.00	
Mrs. Seth E. Sprague	10.00	
Mrs. Robert H. Stevenson	25.00	
Nathaniel H. Stone	100.00	
Miss Abby M. Storer	25.00	
Miss Mary G. Storer	25.00	
Robert W. Storer	25.00	
Miss Alice P. Tapley	100.00	
Mrs. Ezra R. Thayer	15.00	
John E. Thayer	250.00	
Mrs. Nathaniel Thayer	25.00	
Carried forward,	$11,675.00	$62,400.00

Brought forward,	$11,675.00	$62,400.00
Mrs. Washington B. Thomas	10.00	
"The Eugene Tompkins Memorial"	1,000.00	
Charles H. Traiser	25.00	
Henry O. Underwood	100.00	
Mrs. Alexander F. Wadsworth	25.00	
William B. Walker and Mrs. Walker	100.00	
Mrs. Bayard Warren	100 00	
J. Collins Warren	100.00	
Frank G. Webster and Mrs. Webster	100.00	
Welfare Fund, through Charles A. Dean, Trustee	25.00	
Mrs. Henry C. Weston	100.00	
William P. Wharton	50.00	
Mrs. Andrew C. Wheelwright	20.00	
George R. White	500.00	
Edward F. Whitney	100.00	
Frank Whitney	25.00	
George Wigglesworth	100.00	
		14,155.00
Total		$76,555.00

Grants from the funds of the Medical School for work in the laboratory of the Cancer Commission:

Flattery Research Fund	$750.00

To all of these contributors the Commission extends its cordial thanks.

I also have the honor to submit to you a report upon the finances of the Cancer Commission of Harvard University, and of the Collis P. Huntington Memorial Hospital for the year ended June 30, 1917. This report has been prepared and audited by Cooley & Marvin Company, Certified Accountants.

(Signed) ARTHUR ADAMS,
Treasurer.

CANCER COMMISSION OF HARVARD UNIVERSITY

REPORT AND ACCOUNTS

FOR THE YEAR ENDED JUNE 30, 1917

SEPTEMBER 18, 1917

SEPTEMBER 18, 1917.

CANCER COMMISSION OF HARVARD UNIVERSITY, Boston, Mass.

DEAR SIRS: In accordance with your instructions we have supervised the accounting for all funds received and disbursed by the treasurer of the Commission for the year ended June 30, 1917. In reporting thereon we include figures submitted to us by the assistant comptroller of Harvard College pertaining to the funds of the Commission.

We submit herewith the following three exhibits for your consideration:

Exhibit A. — Statement of Funds for the year ended June 30, 1917.

Exhibit B. — Combined Statement of Funds and Cash for the year ended June 30, 1917.

Exhibit C. — Statement of Revenue and Expense for the year ended June 30, 1917.

We call your attention to the following comments upon the matters contained in the above-mentioned exhibits:

Exhibit A:

This exhibit was compiled from statements furnished us by the assistant comptroller of Harvard College. The annual subscriptions reported by him are shown in Exhibit C.

Exhibit B:

We have prepared this exhibit in order to present in consolidated form a summary of the transactions shown in the fund accounts detailed in Exhibit A, together with the cash transactions at the hospital, and the annual subscriptions detailed in Exhibit C.

Exhibit C:

This exhibit presents the details of the revenue and receipts from all sources as well as items of expense and all other disbursements.

The following revenue was received by the treasurer of Harvard College on account of the Cancer Commission:

Interest on Funds controlled by the Treasurer of Harvard College	$20,163.25
Gifts	62,400.00
Medical School Grant	750.00
Annual Subscriptions	14,155.00
Total	$97,468.25

The difference between the above amount and the total receipts, aggregating $112,249.76, as shown on Exhibit C, represents receipts by the Collis P. Huntington Memorial Hospital, which amounted to $14,781.51 during the year under review. Interest received during the year on the bank balances maintained by the treasurer of the Commission as working funds amounted to $54.95, which, when added to the interest on funds controlled by the treasurer of Harvard College, agrees with the total interest on funds aggregating $20,218.20, as shown by the exhibit. In the above this interest has been treated as part of the receipts of the hospital.

Of the expenses set forth in this exhibit, $1,106.59 represents the annual charges made by the University as follows:

Proportionate expense for telephone service	$350.54
Insurance prepaid	245.80
University charge—Purchasing agent	52.38
Inspector's office	145.80
Treasurer's office	212.96
Bursar's office	99.11
Total	$1,106.59

The annual charges of the university as detailed in the foregoing are not under the control of the hospital staff, but in general are determined by the amount of expenses incurred in various departments of the university, which are

apportioned upon arbitrary bases of distribution. Besides the above annual charges there are regular monthly charges made by the university for maintenance, averaging between two and three hundred dollars per month, and monthly charges made by the college for heat, light, power, hot water, and refrigeration, averaging between three and four hundred dollars per month.

Sundry charges amounting to $67,966.66 were paid by the treasurer of Harvard College and charged to the funds of the Commission as follows:

Radium	$58,000.00
Corporation appointments	9,666.66
Piano	300.00
Total	$67,966.66

The balance of the total expenditure, amounting to $37,624.04, was billed direct to the treasurer of the Commission, and such portion of this amount as has been paid was drawn from funds aggregating $25,000.00 advanced by the treasurer of Harvard College to the treasurer of the Cancer Commission and from money received as income by the hospital.

General:

It will be observed from an examination of the following tabulation prepared from data shown on Exhibit C, together with statements of patient and employee days submitted by the accounting department of the hospital, that the average cost of food per patient and employee day amounted to $.54, being a decrease of $.01 in comparison with last year.

In-patient days	6,602	Provisions	$6,843.17
Employee days (est.)	8,228	Kitchen and dining-room	1,297.94
			$8,141.11
		Board of special nurses	80.50
Total in-patient and employee days	14,830	Net food cost	$8,060.61

$$\frac{\$8,060.61}{14,830} = \$.54$$

The operating expenses of the hospital, excluding corporation appointments, new equipment, research expenses, and various miscellaneous expenses, appear as follows:

Administrative	$5,814.58
General house and property	1,502.40
Housekeeping	5,233.25
Laundry	1,059.75
Kitchen and dining-room	1,297.94
Provisions	6,843.17
Care of patients	7,480.55
Photography and X-ray	34.81
Total	$29,266.45

The foregoing expenses were incurred in connection with 6,602 in-patient days and 4,488 out-patient treatments. Assuming the basis of five out-patient treatments being the equivalent of one in-patient day, the above represents an average cost of $3.90 per patient day, being a decrease of $.01 in comparison with the previous year. There has been an increase of 484 in the total number of in-patient days as compared with the total of last year, as well as an increase of 655 in the total number of out-patient treatments. The total expenses of operating the hospital, as shown in the foregoing, in comparison with the corresponding total for the previous year, show an increase of $2,378.09, and all of the individual classifications show increased expenditure, except those of general house and property, housekeeping and photography, and X-ray.

In considering the foregoing details of expenses, it should be borne in mind that the following income was received as a result of operations reflected by those expenses:

Board and care of ward patients	$3,864.60
Board and care of private room patients	3,468.15
Out-patient fees and dressings	1,020.85
Special nursing	367.98
Board of special nurses	80.50
Total	$8,802.08

With an increase of approximately eight per cent in the number of in-patient days, the income from ward and private room patients has decreased one and six-tenths per cent.

With an increase of approximately ten per cent in the number of out-patient visits, there has been an increase in the income from out-patient fees and dressings of approximately thirty-seven per cent. That portion of the income for the year under review, as detailed in the foregoing, in the amount of $8,802.08, is thirty per cent of the related expenditures, aggregating $29,266.45, showing a slight decrease from last year. Income from radium treatments, not included in the foregoing, shows a marked increase.

Accounts receivable, in the amount of $222.35, have been charged against the bad debt reserve of last year of $498.63, which, with a reserve of $459.88 set up for this year, results in a charge of $183.60 against the operations of this year. In addition, charges of the year under review in the amount of $467.07 have been deducted from the various items of income, as they proved uncollectible before the close of the year. Allowances in the amount of $185.99 have been made during the year.

The total expenses of operations were $44,873.63; the hospital revenue was $15,176.46; interest received on funds $20,218.20; making a total revenue of $35,394.66; thus resulting in an operating deficit of $9,478.97, in addition to which there were expenditures of $60,717.07 for new equipment. The gifts received during the year, including medical school grants, amounted to $63,150.00, and annual subscriptions in the amount of $14,155.00 were also received. For the purpose of proving a balance, the excess of gifts and subscriptions over the amount of the deficit and payments for new equipment is accounted for in the following manner:

Gain in funds and cash on hand	$7,527.69
Increase in estimated net value of accounts receivable	142.51
Difference between allowances plus adjustment of reserve for doubtful accounts and discounts received	331.59
Increase in accounts payable (deduct)	892.83
Total	$7,108.96

As a result of our supervision and examination of the books and records of the treasurer of the Cancer Commission of Harvard University:

WE HEREBY CERTIFY:

1. That the balance of cash of the treasurer of the Commission and at the hospital June 30, 1917, amounting to $4,973.71, was on hand as of that date.

2. That the cash shown to have been received at the hospital has been accounted for and that we have seen satisfactory evidence of payment for all disbursements made by the treasurer of the Commission.

3. That the following exhibits, A, B, and C, are in accordance with the books of the hospital and statements submitted by the assistant comptroller of Harvard University.

Very truly yours,

COOLEY & MARVIN CO.

H. L. F.
A. A. D.

EXHIBIT A.

THE CANCER COMMISSION OF HARVARD UNIVERSITY, BOSTON, MASS.

Statement of Funds for the Year Ended June 30, 1917.

	June 30, 1916.						June 30, 1917.			1917-18 Income Estimated @ 4.75%.
	Amount.	Principal.	Income.	Receipts.	Disbursements.	Increase¶ or Decrease.	Principal.	Income.	Amount.	
Cancer Hospital Endowment Fund	$136,822.66	$131,513.51	$5,309.15	$7,046.38 z	$9,214 81	$2,168.43	$131,513.51	$3,140.72	$134,654.23	$6,396.08
Caroline Brewer Croft Fund	92,025.00	92,025.00	. . . . .	4,739.29 z	4,739.29	. . . . .	92,025.00	. . . . .	92,025.00	4,371.19
Emily J. Proctor Gift	2,800.51	2,640.00	160.51	112.02 z	412.02	300.00	2,500.51	. . . . .	2,500.51	118.77†
Francis Bartlett Free Bed Fund	5,000.00	5,000.00	. . . . .	257.50 z	257.50	. . . . .	5,000.00	. . . . .	5,000.00	237.50
L. C. Fenno " " "	5,000.00	5,000.00	. . . . .	257.50 z	257.50	. . . . .	5,000.00	. . . . .	5,000.00	237.50
F. H. Hooper Memorial Free Bed Fund	5,000.00	5,000.00	. . . . .	257.50 z	257.50	. . . . .	5,000.00	. . . . .	5,000.00	237.50
A. L. Hopkins Free Bed Fund	5,000.00	5,000.00	. . . .	257.50 z	257.50	. . . . .	5,000.00	. . . . .	5,000.00	237.50
C. E. Payson " " "	5,000.00	5,000.00	. . . . .	257.50 z	257.50	. . . . .	5,000.00	. . . . .	5,000.00	237.50
Maria D. Lockwood Memorial Fund	50,728.58	50,728.58	. . . . .	2,612.54 z	2,612.54	. . . . .	50,728.58	. . . .	50,728.58	2,409.61
Memorial Cancer Hospital Proctor Maintenance Fund	9,056.97	9,056.97	. . . . .	362.28 z	. . . . .	*362.28*	9,056.97	362.28	9,419.25	447.41†
L. C. Fenno Memorial — treatment by light rays	10,000.00	10,000.00	. . . . .	11,030.00 *	1,030.00	*10,000.00*	20,000.00	. . . . .	20,000.00	950.00
Memorial Cancer Hospital Research Fund,	24,583.40	24,583.40	. . . .	51,975.59※	65,500.00	13,524.41	11,058.99	. . . . .	11,058.99	525.30†
T. Jefferson Coolidge Fund for Cancer Research	2,000.00	2,000.00	. . . .	103.00 z	103.00	. . . . .	2,000.00	. . . . .	2,000.00	95.00
Gift for Salary	1,000 00	. . . . .	1,000.00	1,000.00 =	1,000.00	. . . . .	1,000.00	. . . . .	1,000.00	47.50
Julia M. Moseley Fund	23,250.00	23,250.00	. . . . .	875.00 z	875.00	. . . . .	23,250.00	. . . . .	23,250.00	1,104.38
William Endicott Fund	25,000.00	25,000.00	. . . . .	10,287.50 x	1,287.50	. . . . .	25,000.00	. . . . .	25,000.00	1,187.50
Memorial Cancer Hospital New Laboratory Fund	. . . . .	. . . . .	. . . . .	10,132.15 x	. . . . .	*10,132.15*	10,000.00	132.15	10,132.15	481.28†
Gift for Research in Genetics	320.00	. . . . .	320.00	. . . . .	. . . . .	. . . . .	320.00	. . . . .	320.00	15.20
Flattery Research Fund — Medical School Grant	. . . . .	. . . . .	. . . . .	750.00 @	750.00	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Total	$402,587.12	$395,797.46	$6,789.66	$93,313.25	$88,811.66	*$4,501.59*	$403,453.56	$3,635.15	$407,088.71	$19,336.72
Less transfers	. . . . .	. . . . .	. . . .	10,000.00	10,000.00					
Actual receipts and disbursements	. . . . .	. . . . .	. . . . .	$83,313.25	$78,811.66					

Note: z Interest. = Gifts. @ Grant from Medical School. * Transfer of $10,000.00 from Huntington Hospital Research Fund and $1,030.00, interest. ※ Gifts, $51,400.00, and $575.59 interest. The disbursements of $65,500.00 include the transfer of $10,000.00 to the L. C. Fenno Memorial. x Gifts, $10,000.00, and $132.15, interest. † If the balances of these funds are decreased the rate of income will be less. ¶ Increases are in italics, decreases in black face type.

EXHIBIT B.

THE CANCER COMMISSION OF HARVARD UNIVERSITY,

BOSTON, MASS.

Combined Statement of Funds and Cash for the Year Ended June 30, 1917.

Balance of Funds July 1, 1916	$402,587.12	
Balance of Cash with Treasurer July 1, 1916	1,917.61	
Balance of Hospital Petty Cash Fund	30.00	
Total Funds and Cash July 1, 1916		$404,534.73
Receipts for year — Exhibit C	$112,249.76	
Disbursements for year — Exhibit C	104,722.07	
Excess Receipts over Disbursements		7,527.69
Balance of Funds June 30, 1917	$407,088.71	
Balance of Cash with Treasurer June 30, 1917	4,943.71	
Balance of Hospital Petty Cash Fund	30.00	
Total Funds and Cash June 30, 1917		$412,062.42

EXHIBIT

THE CANCER COMMISSION

BOSTON,

Statement of Revenue and Expense

EXPENSE.

Accounts payable July 1, 1916			$2,565.58
Administration		$5,814.58	
General house and property		1,502.40	
Housekeeping		5,233.25	
Laundry		1,059.75	
Kitchen and dining-room		1,297.94	
Provisions		6,843.17	
Care of patients		7,480.55	
Physical laboratory		2,580.87	
Photography and X-ray		34.81	
Research laboratory		920.54	
Department of genetics		1,482.41	
Hospital laboratory		106.70	
Chemical laboratory		35.76	
Corporation appointments		9,666.66	
Miscellaneous:			
Traveling	$249.10		
Publications	414.50		
Christmas expense	40.93		
Sundries	109.71		
		814.24	
Expense of operation		$44,873.63	
New equipment:			
Radium	$58,000.00		
General house and property	1,554.10		
Photography and X-ray	17.68		
Physical laboratory	1,104.52		
Department of genetics	40 77		
		60,717.07	
Total expenditures		$105,590.70	
Other disbursements:			
Cost of supplies sold and expenses refunded (Contra)		62.20	
			105,652.90
			$108,218.48
Deduct: Disbursements — Exhibit B		$104,722.07	
Discounts received		38.00	
			104,760.07
Accounts payable June 30, 1917			$3,458.41

C.

OF HARVARD UNIVERSITY,

MASS.

for the Year Ended June 30, 1917.

REVENUE.

Accounts receivable July 1, 1916	$1,144.10	
Less: Reserve for doubtful accounts	498.63	
		$645.47
Board and care of ward patients	$3,864.60	
Board and care of private-room patients	3,468.15	
Out-patient fees and dressings	1,020.85	
Radium treatments	5,204.70	
Examinations — surgical	115.00	
Examinations — biological	1.00	
Operations	905.00	
Special nursing	367.98	
Board of special nurses	80.50	
Teaching	77.50	
Miscellaneous	71.18	
Hospital revenue	$15,176.46	
Other Hospital receipts:		
Sale of supplies and expenses refunded (Contra),	62.20	
Interest on Funds	20,218.20	
Gifts and grant from Medical School	63,150.00	
Annual subscriptions	14,155.00	
		112,761.86
		$113,407.33
Deduct: Receipts — Exhibit B	$112,249.76	
Allowances	185.99	
Adjustment of reserve for doubtful accounts receivable	183.60	
		112,619.35
Net worth accounts receivable June 30, 1917		$787.98

Accounts receivable June 30, 1917	$1,247.86	
Less: Reserve for doubtful accounts	459.88	
		$787.98

LIST OF COMMUNICATIONS
CANCER COMMISSION OF HARVARD UNIVERSITY.

1. Statistics of Cancer — W. F. Whitney.
   Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, p. 33. Oct. 23, 1900.

2. On the Etiology of Cancer — E. H. Nichols.
   Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 34–58. Oct. 23, 1900.

3. Report of the Presence of "Plimmer's Bodies" in Carcinomatous Tissue — R. B. Greenough.
   Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 59–62. Oct. 23, 1900.

4. Tumors and Sporozoa of Fishes — E. E. Tyzzer.
   Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 63–68. Oct. 23, 1900.

5. The Reconstruction of a Nodule of Cancer — E. A. Locke.
   Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 69–71. Oct. 23, 1900.

6. Report of Culture Experiments made with Carcinomatous Tissue, 1899–1900 — Oscar Richardson.
   Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 72–80. Oct. 23, 1900.

7. Coccidium Infection of the Rabbit's Liver — E. E. Tyzzer.
   Journal of Medical Research, Vol. 7, No. 3, pp. 235–254. April, 1902.

8. Molluscum Contagiosum — Charles J. White and W. H. Robey, Jr.
   Journal of Medical Research, Vol. 7, No. 3, pp. 255–277. April, 1902.

9. Culture Experiments with Malignant Tumors — Oscar Richardson.
   Journal of Medical Research, Vol. 7, No. 3, pp. 278–279. April, 1902.

10. Four Pathogenic Torulæ (Blastomycetes) — Joseph D. Weis.
    Journal of Medical Research, Vol. 7, No. 3, pp. 280–311. April, 1902.

11. The Relation of Blastomycetes to Cancer — E. H. Nichols.
    Journal of Medical Research, Vol. 7, No. 3, pp. 312–359. April, 1902.

12. Cell Inclusions in Cancer and in Non-cancerous Tissue — R. B. Greenough.
Journal of Medical Research, Vol. 7, No. 3, pp. 360–380. April, 1902.

13. A Contribution to the Classification of Tumors — F. B. Mallory.
Journal of Medical Research, Vol. 13, No. 2, pp. 113–136. January, 1905.

14. On the Nature of the Cell Inclusions of Cancer — R. B. Greenough.
Journal of Medical Research, Vol. 13, No. 2, pp. 137–166. January, 1905.

15. The Effects of the Röntgen Ray upon Cancer — Robert H. Vose and Walter C. Howe.
Journal of Medical Research, Vol. 13, No. 2, pp. 167–185. January, 1905.

16. Implantation of Tissue and its Relation to Cancer — E. H. Nichols.
Journal of Medical Research, Vol. 13, No. 2, pp. 187–232. January, 1905.

17. The Inoculable Tumors in Mice — E. E. Tyzzer.
Journal of Medical Research, Vol. 17, No. 2, pp. 137–153. November, 1907.

18. A Series of Twenty Spontaneous Tumors in Mice, with the Accompanying Pathological Changes and the Results of the Inoculation of Certain of these Tumors into Normal Mice — E. E. Tyzzer.
Journal of Medical Research, Vol. 17, No. 2, pp. 155–197. November, 1907.

19. A Study of Heredity in Relation to the Development of Tumors in Mice — E. E. Tyzzer.
Journal of Medical Research, Vol. 17, No. 2, pp. 199–211. November, 1907.

20. A Transmissible Cancer of the Rat considered from the Standpoint of Immunity — F. P. Gay.
Journal of Medical Research, Vol. 20, No. 1, pp. 175–201. January, 1909.

21. The Lesions of the Skin and the Tumor Formations in Xeroderma Pigmentosum — W. T. Councilman and G. B. Magrath.
Journal of Medical Research, Vol. 21, No. 3, pp. 331–355. October, 1909.

22. The Surgical Treatment of X-ray Carcinoma and Other Severe X-ray Lesions based upon an Analysis of Forty-seven Cases — C. A. Porter.
Journal of Medical Research, Vol. 21, No. 3, pp. 357–413. October, 1909.

23. The Pathological Histology of Chronic X-ray Dermatitis and Early X-ray Carcinoma — S. B. Wolbach.
Journal of Medical Research, Vol. 21, No. 3, pp. 415–449. October, 1909.

24. Chronic Pancreatitis with Tumor-like Nodules in the Cat — Thomas Ordway.
Journal of Medical Research, Vol. 21, No. 3, pp. 451–458. October, 1909.

25. Tumors in the Common Fowl — E. E. Tyzzer and Thomas Ordway.
Journal of Medical Research, Vol. 21, No. 3, pp. 459–477. October, 1909.

26. A Series of Spontaneous Tumors in Mice with Observations on the Influence of Heredity on the Frequency of their Occurrence — E. E. Tyzzer.
Journal of Medical Research, Vol. 21, No. 3, pp. 479–518. October, 1909.

27. A Study of Inheritance in Mice with Reference to their Susceptibility to Transplantable Tumors — E. E. Tyzzer.
Journal of Medical Research, Vol. 21, No. 3, pp. 519–573. October, 1909.

28. The Nature of the Reaction of the Tissues of Susceptible and Non-susceptible Mice to an Inoculable Tumor — A. M. Burgess.
Journal of Medical Research, Vol. 21, No. 3, pp. 575–590. October, 1909.

29. The Effect of Trypsin on Cancer and on the Germ Cells in Mice — Stephen Rushmore.
Journal of Medical Research, Vol. 21, No. 3, pp. 591–596. October, 1909.

30. The Treatment of Cancer with Body Fluids and Cancerous Ascitic Fluid — E. H. Risley.
Journal of the American Medical Association, Vol. 56, pp. 1383–1389. May 13, 1911.

31. The Hemolytic Skin Reaction in Carcinoma — E. H. Risley.
The Boston Medical and Surgical Journal, Vol. 165, No. 4, pp. 127–128. July 27, 1911.

32. The Gilman-Coca Vaccine Emulsion Treatment of Cancer — E. H. Risley.
The Boston Medical and Surgical Journal, Vol. 165, No. 21, pp. 784–788. Nov. 23, 1911.

33. The Huntington Hospital and the Scope of its Work — E. E. Tyzzer and Thomas Ordway.
Boston Medical and Surgical Journal, Vol. 166, No. 2, pp. 887–889. June 13, 1912.

34. Tumor Investigation — A General View of Various Lines of Activity — E. E. Tyzzer.
Harvard Graduates' Magazine, Vol. 21, No. 82. December, 1912.

35. The Collis P. Huntington Hospital for Cancer Research — Robert B. Greenough and Thomas Ordway.
Harvard Graduates' Magazine, Vol. 21, No. 82. December, 1912.

36. Factors in the Production and Growth of Tumor Metastases — E. E. Tyzzer.
Journal of Medical Research, Vol. 28, No. 2, pp. 309–332. July, 1913.

37. The Complement Content of the Blood in Malignant Disease — Thomas Ordway and Ellis Kellert.
Journal of Medical Research, Vol. 28, pp. 287–299. July, 1913.

38. The Protein Metabolism in Certain Tumor-bearing Rats — Thomas Ordway and J. Lucien Morris.
Journal of Medical Research, Vol. 28, No. 2, pp. 301–308. July, 1913.

39. The Use of Radium in Cancer and Allied Conditions at the Huntington Hospital — Illustrative Cases. A report of the Cancer Commission of Harvard University, presented by Thomas Ordway.
Boston Medical and Surgical Journal, Vol. 171, No. 21, pp. 771–781. Nov. 19, 1914.

40. Carcinoma, Syphilis, and Tuberculosis co-existent in the Same Patient, with Report of a Case — Ellis Kellert.
Journal of the American Medical Association, 1914, Vol. 63, p. 1819.

41. The Importance of Inflammation in the Immunity of Mice to Implanted Tumor — E. E. Tyzzer.
Journal of Medical Research, Vol. 32, pp. 201–223. May, 1915.

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