

Annual report of the Collis P. Huntington Memorial Hospital for Cancer Research and of the laboratories of the Cancer Commission of Harvard University : 1922-23.

Contributors

Harvard University. Cancer Commission.

Publication/Creation

Boston, Mass. : Cancer Commission, 1923

Persistent URL

<https://wellcomecollection.org/works/ctrey45t>

License and attribution

This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

THIS BOOK
IS THE PROPERTY OF THE
ROYAL VETERINARY COLLEGE
CAMDEN TOWN

Cancer Commission of Harvard University

ELEVENTH ANNUAL REPORT

OF THE

COLLIS P. HUNTINGTON MEMORIAL HOSPITAL
FOR CANCER RESEARCH

AND OF THE

LABORATORIES

OF THE

CANCER COMMISSION OF HARVARD UNIVERSITY

1922-1923

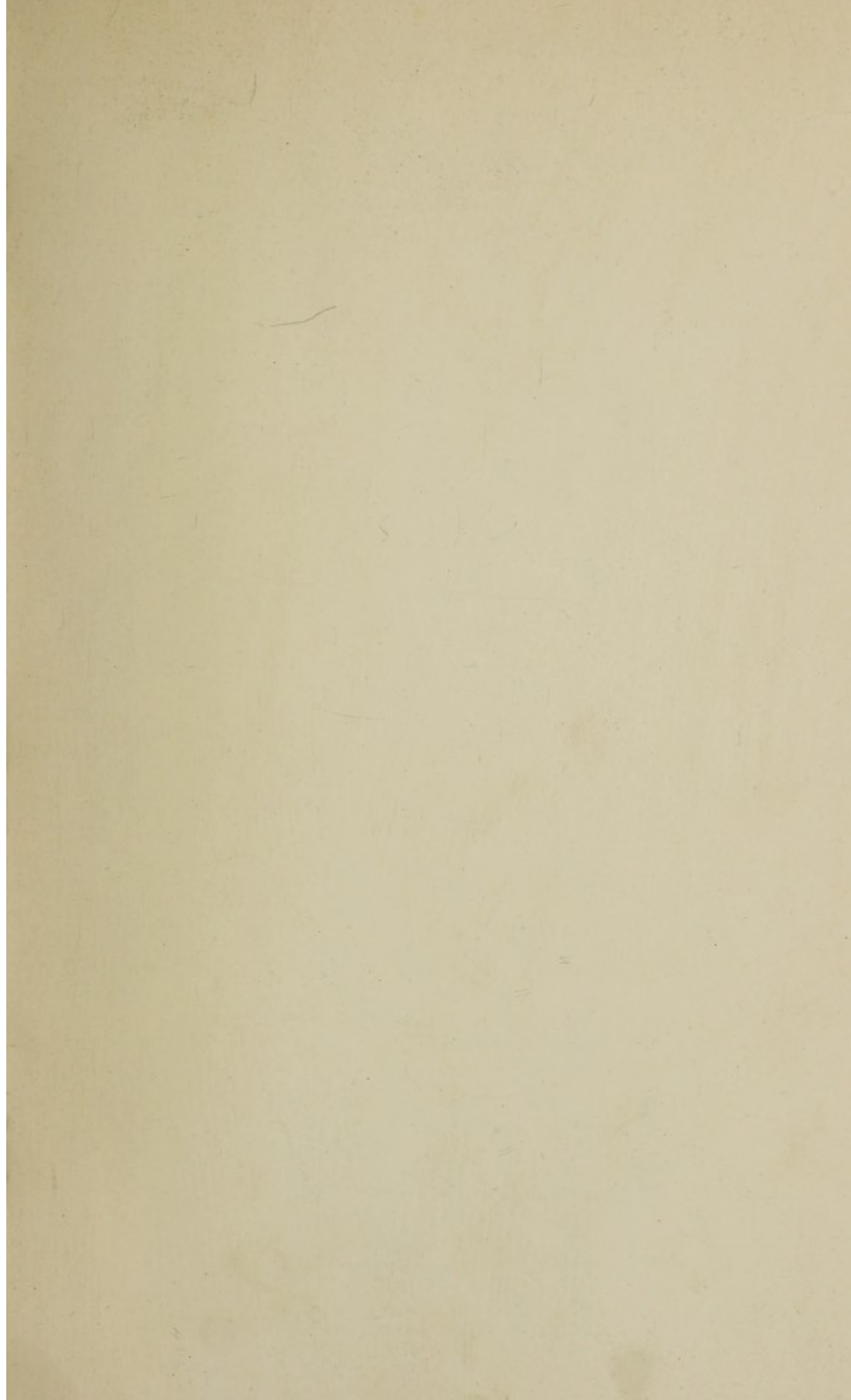
(FOR THE YEAR ENDING JUNE 30, 1923)

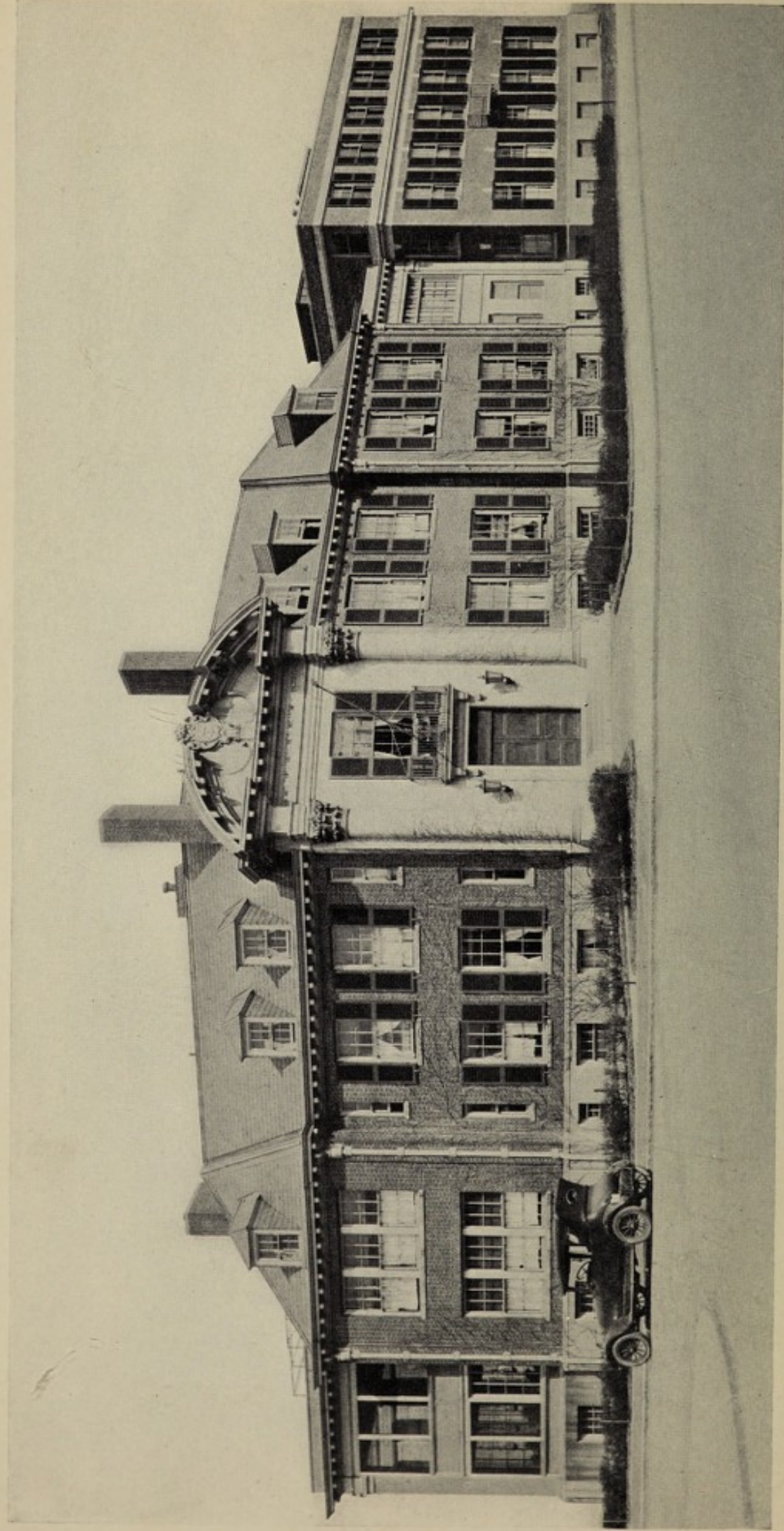
BOSTON
MASSACHUSETTS

WELLCOME
LIBRARY
Ann. Sep
QZ28
.FM4
C71
1922-23



22501923844





THE COLLIS P. HUNTINGTON MEMORIAL HOSPITAL AND THE NEW LABORATORY BUILDING, 1921.

COOLIDGE & SHATTUCK, ARCHITECTS.

Cancer Commission of Harvard University

ELEVENTH ANNUAL REPORT

OF THE

COLLIS P. HUNTINGTON MEMORIAL HOSPITAL
FOR CANCER RESEARCH

AND OF THE

LABORATORIES

OF THE

CANCER COMMISSION OF HARVARD UNIVERSITY

1922-1923

(FOR THE YEAR ENDING JUNE 30, 1923)

BOSTON
MASSACHUSETTS

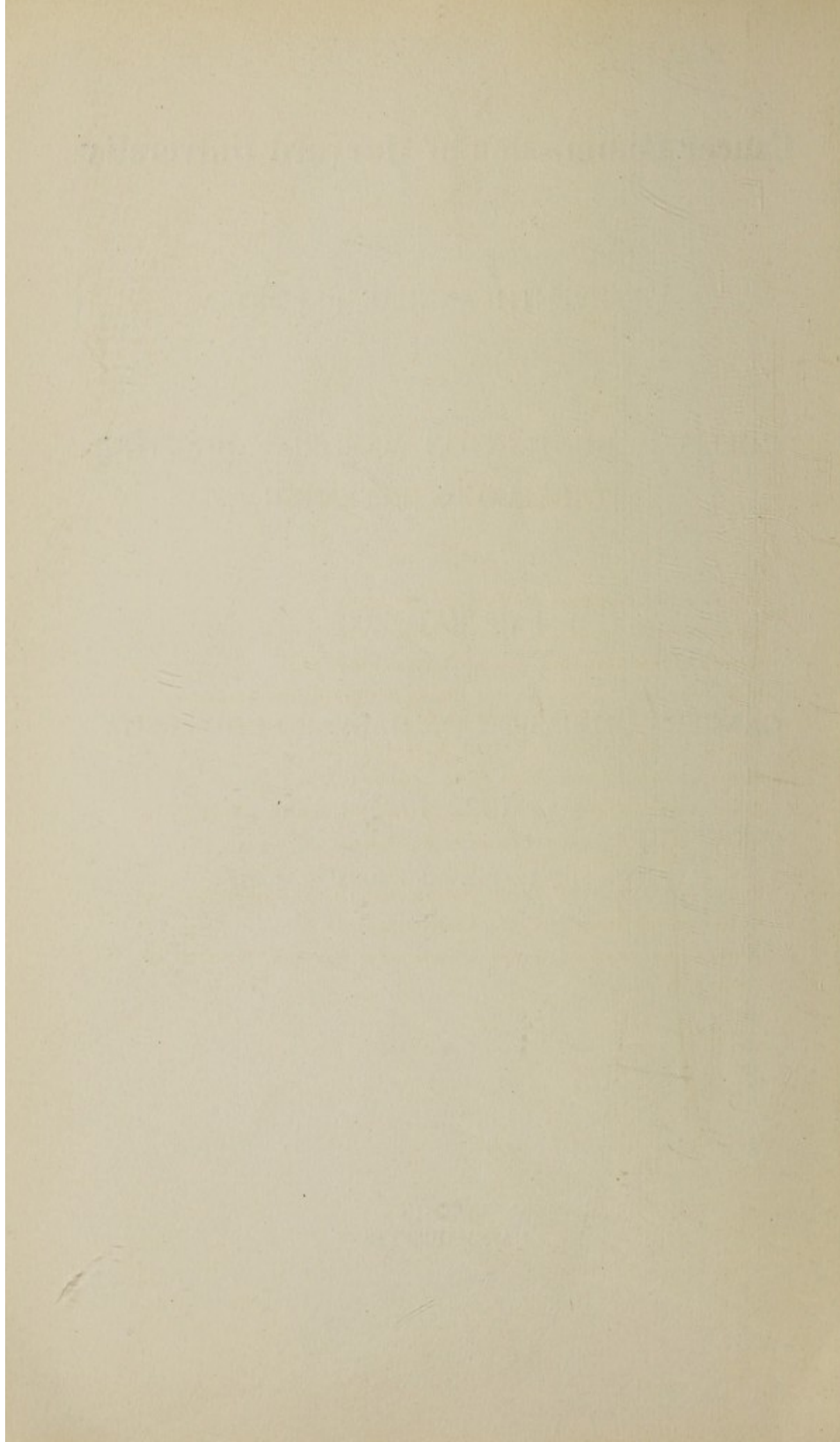


TABLE OF CONTENTS

	PAGE
THE CANCER COMMISSION OF HARVARD UNIVERSITY	5
REPORT OF THE CHAIRMAN, HENRY P. WALCOTT, M.D.	7
REPORT OF THE DIRECTOR, ROBERT B. GREENOUGH, M.D.	9
REPORT OF THE SURGEON TO THE COLLIS P. HUNTINGTON MEMORIAL HOSPITAL, CHANNING C. SIMMONS, M.D.	19
REPORT OF THE PHYSICIAN, GEORGE R. MINOT, M.D.	32
REPORT OF THE MATRON, MISS ANNA L. GIBSON, R.N.	36
REPORT OF THE RESEARCH FELLOW IN PHYSICS, WILLIAM DUANE, PH.D.	42
REPORT OF THE RESEARCH FELLOW IN BIO-PHYSICS, WILLIAM T. BOVIE, PH.D.	44
REPORT OF THE STATE DIAGNOSIS SERVICE, JAMES H. WRIGHT, M.D.	48
REPORT OF THE TREASURER, MR. CHARLES JACKSON	50
LIST OF COMMUNICATIONS, CANCER COMMISSION OF HARVARD UNIVERSITY	66

FORM FOR DONATIONS AND BEQUESTS

I give, devise and bequeath unto the President and Fellows of Harvard College, the sum of \$. to be used for the work of the Cancer Commission of Harvard University.

In case the Commission should decide at any time that the cause and treatment of cancer had been sufficiently determined I authorize them to devote this bequest to some other unsolved problem of medicine.

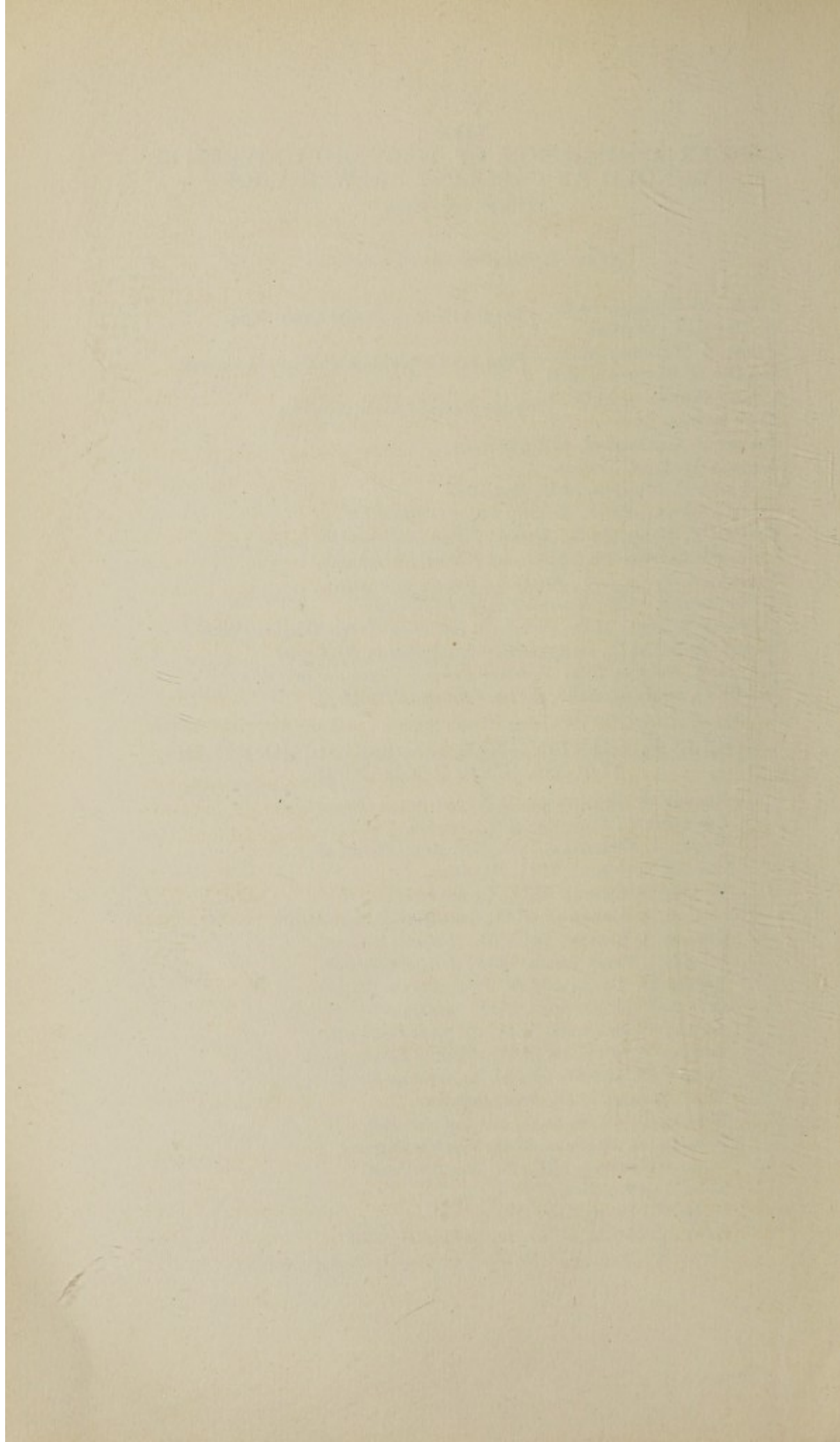
THE
CANCER COMMISSION OF HARVARD UNIVERSITY
FOUNDED BY CAROLINE BREWER CROFT
JUNE 16, 1899

HENRY P. WALCOTT, M.D., *Chairman*

J. COLLINS WARREN, M.D.	}	For the Caroline Brewer Croft Fund.
M. DOUGLAS FLATTERY		
HENRY P. WALCOTT, M.D.	}	For the Corporation of Harvard College.
EDWARD H. BRADFORD, M.D.		
S. BURT WOLBACH, M.D.	}	For the Harvard Medical School.
E. E. TYZZER, M.D.		
ROBERT B. GREENOUGH, M.D., <i>Director</i> .		
CHARLES JACKSON, <i>Treasurer</i> .		
CHANNING C. SIMMONS, M.D., <i>Secretary</i> .		
WILLIAM DUANE, PH.D., <i>Research Fellow in Physics</i> .		
WILLIAM T. BOVIE, PH.D., <i>Research Fellow in Biophysics</i> .		
E. LEON CHAFFEE, PH.D., <i>Research Fellow in Biophysics</i> .		
CHARLES E. BARR, A.M., <i>Research Fellow in Biophysics</i> .		
HENRY LYMAN, M.D., <i>Research Fellow in Chemistry</i> .		
J. HOMER WRIGHT, M.D., <i>Pathologist in Charge of Free Diagnosis Service</i> .		
STUART MUDD, M.D., <i>Assistant Research Fellow in Biophysics</i> .		
WALTER S. HUGHES, S.B., <i>Assistant Research Fellow in Biophysics</i> .		
TREVOR G. BROWNE, M.D., <i>Research Fellow in Pathology</i> .		

COLLIS P. HUNTINGTON MEMORIAL HOSPITAL
FOR CANCER RESEARCH

ROBERT B. GREENOUGH, M.D., *Surgeon in Charge*.
CHANNING C. SIMMONS, M.D., *Surgeon*.
HENRY A. CHRISTIAN, M.D., *Consulting Physician*.
GEORGE R. MINOT, M.D., *Physician*.
D. CROSBY GREENE, M.D., *Laryngologist*.
LAWRIE B. MORRISON, M.D., *Consulting Roentgenologist*.
GEORGE A. LELAND, JR., M.D., *Assistant Surgeon*.
GEORGE GILBERT SMITH, M.D., *Assistant Surgeon*.
ERNEST M. DALAND, M.D., *Surgeon to Out-Patients*.
LELAND S. MCKITTRICK, M.D., *Surgeon to Out-Patients*.
THOMAS E. BUCKMAN, M.D., *Assistant Physician*.
EDWARD W. HERMAN, M.D., *Assistant Laryngologist*.
ARTHUR M. GREENWOOD, M.D., *Assistant Dermatologist*.
M. C. SOSMAN, M.D., *Roentgenologist*.
WILLIAM L. DAVIS, M.D., *Surgical Assistant*.
WILLIAM M. SHEDDEN, M.D., *Resident Surgeon*.
JAMES HITCHCOCK, M.D., *Resident Physician*.
H. A. LAWSON, *House Officer*.
R. H. WHITHAM, *House Officer*.
ANNA L. GIBSON, R.N., *Matron-Superintendent*.
MYRA B. CONOVER, R.N., *Assistant Matron-Superintendent*.



REPORT OF THE CHAIRMAN
TO THE
CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: I submit herewith the reports of the various heads of departments of the staff of the Cancer Commission of Harvard University, for the fiscal year ending June 30, 1923.

The most notable features of the year's work of the Commission were the development of deep X-ray therapy with the high-voltage X-ray apparatus devised by Dr. Duane, and the organization of the Medical Laboratory.

With the completion of the John Collins Warren Laboratory the use of the high-voltage X-ray apparatus in the treatment of actual cases of cancer was begun. While it is too soon to speak of the end-results of treatment with this machine, already it is evident that its action is far more powerful than the apparatus in use heretofore.

The organization of the Medical Laboratory Department under Dr. George R. Minot has given an opportunity for the study of the constitutional effects produced by the Duane X-ray machine which have proved of the greatest value, and as a result of these investigations it has been possible to establish the conditions under which this form of treatment can safely be administered.

During the fiscal year gifts to the amount of \$135,000 were received to be added to the funds of the Commission. These funds were as follows:

The Elizabeth Worcester Mills Fund.....	\$100,000
The Charles S. Fairchild Fund.....	5,000
The H. O. Underwood Bequest.....	10,000
The John Hancock Mutual Life Insurance Co.....	20,000

In addition to these funds, \$40,710 was contributed from many donors for immediate use.

It is greatly to be desired that the invested funds of the Commission be increased to such a point that the assured annual income may be sufficient for the maintenance of its activities, but until this endowment can be secured the gen-

erous support of the work of the Commission by annual subscription must be continued and augmented if this important work is not to be curtailed.

The reports of the heads of the different departments are herewith presented.

Respectfully,

HENRY P. WALCOTT, *Chairman.*

July 1, 1923.

REPORT OF THE DIRECTOR
TO THE
CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: I have the honor to submit the following report upon the work of the Cancer Commission of Harvard University for the twelve months — July 1, 1922, to July 1, 1923. The regular work of the hospital and of the laboratories has been carried on as usual. The Department of X-ray Therapy has been developed during this period and has affected materially the work of the Commission. The Medical Laboratory Department has also been developed as the importance of the study of the constitutional effects of deep radiation became more and more evident.

The report for the fiscal year ending July 1, 1922, was prepared and issued in March, 1923. This report showed an operating surplus of about seven thousand dollars for the year 1921-1922 which, however, was converted into a deficit by the purchase of X-ray and laboratory equipment, and furnishings for the new building. The work of the fiscal year ending July 1, 1923, has been carried on on the estimates prepared and approved in May, 1922. These estimates, however, have not been justified by the operations of the past year. It was expected that the receipts from the use of the new X-ray apparatus would contribute materially toward carrying on the expense of its operation. As a matter of fact this has not been the case, for many of the patients suitable for the deep X-ray were quite unable to pay anything approaching the cost of maintenance of this department.

Two hundred and thirty-one treatments had been given to seventy-eight patients on May 1, 1923. A rough estimate of the cost of maintenance of the X-ray Department places the cost of each individual treatment at \$46, and each patient has thus cost us about \$137.50. The receipts from these treatments have amounted to only about \$15 per patient. This in itself, of course, represents a severe expense to the hospital, but this does not by any means cover the entire cost, for it was believed

to be inadvisable to give treatments with the Duane apparatus unless the patient could remain in the hospital for observation for a period of from two to four days, on account of the severe constitutional reaction following treatment. This period of hospitalization not only adds to the cost of treatment for each patient over and above the figures stated, but also diminishes, to a certain extent, the number of patients which can be admitted to the hospital for other forms of treatment, such as radium application or operation, which have been the chief sources of hospital revenue.

The number of new patients received at the hospital during the year was 1,599 or 37 less than in the previous year, but the actual number of patients entering the hospital wards for examination and treatment was 1,264, and the number of in-patient days 6,115 — an increase over the previous year. The hospital receipts for the year were \$47,714 as against \$46,930.12 of the year before. The ordinary expenses of administration, laboratory supplies and service, house-keeping, provisions, care of patients, etc., have shown no material diminution in cost, but rather an increase during the year. In spite of all these facts an operating surplus would be shown if it were not for the fact that the change made in the accounting system involved a charge of thirteen months' expenses and of fourteen months' salaries during the twelve months of the fiscal year. As a result of these charges the accounts show a net deficit for the year of \$4,206.40.

Finances

\$100,000 — one-half of the Elizabeth Worcester Mills Fund — has been received by the Treasurer of the University during the fiscal year. A bequest of \$10,000 from the will of H. O. Underwood, and a gift of \$5,000 from Charles S. Fairchild are also to be acknowledged as additions to the permanent funds. One other notable gift of \$20,000 was made by the John Hancock Mutual Life Insurance Company, raising the total of their contribution to \$50,000. It is stipulated that \$5,000 of the John Hancock gift be available for the purchase of a diagnostic X-ray apparatus, and that the remainder be retained in the New Endowment Fund.

While the operation of the diagnostic X-ray apparatus will

involve a certain amount of additional expense — estimated at \$3,000 — it is believed that this will be met partly by the John Hancock gift to the Endowment and partly by economies in the operation of the treatment apparatus which will thus be made possible.

During the year a number of conferences were held with Mr. Mead, the Comptroller, and Mr. Taylor, the Auditor, of the University. As a result of these conferences a change in the financial arrangements of the Commission was decided upon and the plan was put in operation at the beginning of the fiscal year, July 1, 1923.

The plan involves dispensing with the services of the former accountants — Cooley & Marvin — and placing the hospital accounts, as well as the bank account of the Commission, entirely in the hands of the University. It is estimated that an annual saving of approximately \$1,000 will be made possible by this change, and the division of responsibility between the office of the Treasurer of the University and that of the Treasurer of the Commission will be done away with and a much more accurate system of monthly reports will be made possible.

An important feature of the proposed change of the accounting system is a series of monthly reports which give the total expenditure and total income for each month during the year, whereas the accounting system which has been in use hitherto dealt only with the payments in and out, and made no recognition of the amount of supplies consumed, or of the amount remaining on hand, the bills for one month's supplies being paid during the subsequent month.

In order to put the new system in effect July 1, 1923, a total of thirteen months' expenditure was charged against the fiscal year 1922-1923, whereas no corresponding item enters the account on the side of the receipts. An inventory of unconsumed supplies, however, has been introduced in the new plan.

A further extra payment is included in the year's accounts owing to the fact that salaries voted by the Corporation run from September 1 to September 1, and the money to pay salaries during July and August 1923 was withdrawn from the Cancer Commission funds prior to July 1, 1923. Thus fourteen months instead of twelve months of salaries voted by the Corporation are charged against the fiscal year ending July 1,

1923. These two items far exceed the net deficit of \$4,206.40 above referred to, and the actual operation of the hospital, and of the laboratories, for the twelve months of the fiscal year was thus accomplished without a deficit.

The general policy of the administration of the hospital and of the laboratories has continued as in previous years. A study of the departmental expense accounts indicates that the estimates approved in May 1922 have been closely followed, especially in those departments, such as Administration, Kitchen, Provisions, Care of Patients, etc., which come directly under the control of Miss Gibson, the superintendent. She has made a fine record for efficient and economical administration. Detailed reports have been submitted to the Director by the head of each department and these reports will be briefly summarized.

Physical Laboratory — Dr. Duane

Dr. Duane reports that the radium plant has been in operation providing emanation applicators for the Huntington Hospital as well as for the Massachusetts General Hospital, for whom we are storing two hundred and fifty milligrams (250 mgms.) of radium, in accordance with the arrangement made last year.

The new high-voltage X-ray apparatus developed certain defects of insulation during the hot weather of the summer of 1922. These defects have been remedied by means of certain original devices, and during the remainder of the year the power plant has been operating satisfactorily, without interruption.

A constant expense has been incurred by reason of the breakage of X-ray tubes. By cutting down the power and operating over longer periods this breakage has been diminished but is still a source of considerable expense. Diminishing the intensity of radiation and increasing the time tends also to diminish somewhat the immediate constitutional effects. The determination of the erythema dose of radiation is attended by much difficulty and there appears to be a wide variation of the sensitiveness of the skin of different individuals. Dr. Duane raises the question of whether a similar sensitiveness may not

exist in regard to the other tissues of different individuals, especially tumor tissue.

Dr. Duane has continued his courses in the University in Cambridge and has given some of his time to the work of the National Research Council.

Dr. Bovie

Dr. Bovie has continued the work in the laboratory of Biophysics as well as the course which he was giving in the undergraduate department of Harvard University. The popularity of this course continues and a certain amount of advanced work has been done by Dr. Bovie's students in the second half year, working in the J. Collins Warren Laboratory. Work has been continued upon the "eye experiment" which has been carried on in collaboration with Assistant Professor Chaffee. The color sensitivity of the frog's retina has been studied and a paper based upon the results of this experiment was published in January 1923.

Mr. Walter Hughes has been working upon the differences of electrical potential encountered in biological work and Professor Barr has been studying surface-tension phenomena from the same point of view.

During the past year Mr. Gast — a graduate student from the Department of Forestry — has been working on photo-electric phenomena in relation to forest growth. This work has been done in coöperation with Professor Fisher of the Department of Forestry in Cambridge, and only the laboratory expenses of the research have been borne by the Commission.

Dr. Mudd continued his work with filterable organisms and published the results. He has now accepted an appointment at the Rockefeller Institute and will not be available for work under the Cancer Commission during the coming year.

Other studies have been made of the coagulation of egg albumen and other effects of ultra-violet light.

Dr. Bovie has spoken before a number of Society meetings during the year and the work of his laboratory always arouses the greatest interest.

Dr. Henry Lyman

Dr. Henry Lyman has been unable to continue his work as Chemist during the past year on account of illness. The laboratory has remained in operation, however, and work has been done, under Dr. Folin, by Dr. Lyman's assistant, Mrs. Pearse, upon the nitrogenous excretion in cancer patients and in other individuals.

The Free Diagnosis Service

The Free Diagnosis Service maintained for the State of Massachusetts has continued to increase in activity and 1,544 specimens, emanating from small hospitals in the State, chiefly those outside of Boston, were examined in the twelve months of the fiscal year.

An improved technique for fixation and examination of specimens was introduced in March 1923, and by this method the material coming to the laboratory has been made more useful for investigation and for teaching purposes.

The Medical Laboratory

Plans were developed during the year for the organization of a department of clinical investigation. The opportunity for this work came especially through the use of the new X-ray machine and the profound constitutional effects produced by short wave-length X-ray therapy. As soon as the new machine was used it was found that much more accurate studies of the constitutional results were needed for the protection of the patient as well as of the operators of the apparatus.

Dr. George R. Minot, who, as physician, had charge of the cases of blood diseases, consented to give a much larger amount of his time to these problems, and plans for the organization of this department gradually developed which permit a much closer affiliation of the hospital with the work of the Medical School and especially with the Department of Medicine.

With this department organized as planned it will be possible to carry on intensive investigation upon the constitutional effects of radiation in relation to the changes in the blood and in the accompanying alterations of the chemistry, and serological reactions of the body fluids.

Hospital Departments

The general conduct of the hospital during the past year is the same as in years gone by and no change in policy in regard to the reception and treatment of patients has been necessary. A number of meetings of medical and scientific societies have been held at the hospital and clinics demonstrating the work have been well attended.

The number of new patients coming to the hospital is practically the same as in the year before, but a larger number of patients have been taken into the hospital for examination and treatment by operation, radium or X-ray. The out-patient department has received more patients than in any year since the opening of the Institution.

The arrangement made with the John Hancock Life Insurance Company for the free examination of their policy-holders has resulted in the presentation of fifty-three patients for examination under these conditions. This service has apparently been satisfactory to all concerned. A considerable number of these cases required gastro-intestinal X-ray studies to complete the clinical data, and it was necessary to send these cases elsewhere for examination. It is with the object of avoiding the necessity of sending these patients out of the hospital that the John Hancock Company has offered to provide us with a diagnostic X-ray apparatus.

The division of responsibility for the different groups of surgical cases has been continued and reports are provided by the members of the Staff in charge of the different special assignments as follows:

Dr. Channing C. Simmons has charge of the cases of cancer of the mouth, tongue and jaw.

Dr. D. Crosby Greene has the cases of cancer of the nose, throat and upper air passages.

Dr. George G. Smith has charge of the genito-urinary service.

Dr. Leland S. McKittrick has the cases of cancer of the rectum.

Dr. G. A. Leland, Jr., has continued in charge of the cases of cancer of the uterus and female generative organs.

The work of each of these different members of the Staff is eminently satisfactory and cases have been studied with care, the end-results have been collected and reports have been made of the work along these special lines.

The cases submitted to heavy X-ray therapy have required the combined attention of representatives of the Clinical Staff and of the X-ray Department. All of these cases have been assigned to Dr. E. M. Daland for supervision after treatment, and a report has been prepared by Dr. Daland which indicates that marked benefit is obtained in individual cases following X-ray treatment, but that the effects apparently differ only in degree from those obtained by less powerful apparatus, and that this increased effect is obtained at the expense of more serious reactions both of the exposed skin and of the patient's constitution as a whole.

It is planned to continue the X-ray treatment service during the coming year, and it is hoped that further study may make it possible to eliminate some of the more severe effects to the end that treatments can be given without obtaining such severe reactions as to require hospitalization. If this were done the effectiveness of the clinic would be much increased.

To make a brief summary of the work of the Commission for the year 1922-1923 it may be said that the policy formulated some years ago has been maintained, namely: to carry on investigation both in the laboratory and in the clinic, with a view to the study of the nature of cancer, to the development of new methods of treatment of this disease, and to the better utilization of the methods of treatment now available. To this end a department of bio-physics has been developed in which the more abstract and theoretical questions of cell growth, and the effects upon cell growth of agents such as radiation, can be studied. No attempt is made to restrict this department to the clinical problems of cancer, as it is believed that any increase in knowledge of cell growth will contribute ultimately in some degree to the elucidation of this problem.

In addition to the fundamental research work in bio-physics investigations have been continued both in the laboratory and in the clinic, looking to the development of better physical methods for the production, measurement and administration of radio-active agents, including radium and X-ray, and of the local and constitutional effects produced by these agents when applied to living tissues. Finally the employment of these agents as well as others in the actual treatment of patients afflicted with cancer has been continued, careful records of the

results of treatment have been made, a most effective follow-up system has been established in order that knowledge of the end-results of treatment may be made available for record, and reports of series of cases of cancer in its different locations have been prepared and presented from time to time. It is believed that only in some such manner as this can certain and reliable progress be made in dealing with this complex problem.

Respectfully submitted,

R. B. GREENOUGH, *Director.*

July 1, 1923.

SUMMARY OF ACCOUNTS
CANCER COMMISSION OF HARVARD UNIVERSITY
1922-1923

<i>Expense</i>	1921-1922		1922-1923	
Total Hospital Departments...	\$62,850.07		\$66,073.30	
Total Laboratory Departments...	18,951.31		26,638.53	
Operating Expenses.....		\$81,801.38		\$92,711.83
Salaries, Hospital.....	7,274.99		10,350.00	
Salaries, Laboratory.....	10,983.34		13,662.50	
Total Salaries.....		18,258.33		24,012.50
Total Expense.....		\$100,059.71		\$116,724.33
Equipment (Hospital).....	1,552.21		1,309.52	
Reserve Bad Debts.....	2,350.93		11,634.03	
Paid on New Laboratory.....	149,208.07		1,438.79	
Equipment New Laboratory.....	14,592.94		1,932.71	
Net Gain in Funds.....	4,176.08		123,405.81	
		\$171,880.23		\$139,720.86
		\$271,939.94		\$256,445.19

<i>Receipts</i>				
Interest on Funds.....	\$19,761.06		\$22,621.18	
Gifts — Immediate Use.....	2,980.00		3,480.00	
State of Massachusetts.....	3,750.00		2,500.00	
Annual Subscription.....	34,115.00		36,230.00	
Hospital Revenue.....	46,601.82		47,714.00	
Flattery Fund.....	584.06		472.42	
Pingree Fund.....			1,000.00	
Available Annual Income.....		\$107,791.94		\$114,017.60
Income Building Fund.....	\$787.39			
Endowment Fund.....	7,396.51			
Gifts to Building Fund.....	16,750.00			
Gifts to Capital Funds.....	4,025.00		135,000.00	
Accumulated Income.....	151.08		156.50	
Loss in Cash.....	3,367.34			
Building Fund.....	118,354.56		438.79	
DeLamar Fund.....	13,316.12		6,832.30	142,427.59
Net Accruals.....		\$164,148.00		
		\$271,939.94		\$256,445.19

REPORT OF THE SURGEON TO THE CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: The work of the Collis P. Huntington Memorial Hospital has been carried on during the fiscal year 1922-1923 with the following staff:

ROBERT B. GREENOUGH, M.D., *Surgeon in Charge.*
 CHANNING C. SIMMONS, M. D., *Surgeon.*
 HENRY A. CHRISTIAN, M.D., *Consulting Physician.*
 GEORGE R. MINOT, M.D., *Physician.*
 D. CROSBY GREENE, M.D., *Laryngologist.*
 LAWRIE B. MORRISON, M.D., *Consulting Roentgenologist.*
 GEORGE A. LELAND, JR., M.D., *Assistant Surgeon.*
 GEORGE GILBERT SMITH, M.D., *Assistant Surgeon.*
 ERNEST M. DALAND, M.D., *Surgeon to Out-Patients*
 LELAND S. MCKITTRICK, M.D., *Surgeon to Out-Patients.*
 THOMAS E. BUCKMAN, M.D., *Assistant Physician.*
 EDWARD W. HERMAN, M.D., *Assistant Laryngologist.*
 ARTHUR M. GREENWOOD, M.D., *Assistant Dermatologist.*
 M. C. SOSMAN, M.D., *Roentgenologist.*
 WILLIAM L. DAVIS, M.D., *Surgical Assistant.*
 WILLIAM M. SHEDDEN, M.D., *Resident Surgeon.*
 JAMES HITCHCOCK, M.D., *Resident Physician.*
 H. A. LAWSON, *House Officer.*
 R. H. WHITHAM, *House Officer.*
 ANNA L. GIBSON, R.N., *Matron-Superintendent.*
 MYRA B. CONOVER, R.N., *Assistant Matron-Superintendent.*

In addition to the above staff, members of several departments of the Harvard Medical School have been called upon in the capacity of consultants. We wish to thank especially Dr. Harvey Cushing, Dr. George S. Derby, Dr. R. B. Osgood, Dr. W. E. Paul and Dr. C. Morton Smith for valuable aid in certain cases. Dr. L. B. Morrison has continued to care for patients requiring low-voltage X-ray treatment and has done the work without charge for patients financially in poor circumstances.

During the year 1,599 new patients were examined at the hospital, 37 less than in the previous year. There were 7,748 out-patient visits as against 7,331 in 1921-1922 and 6,115 in-patient days, as against 5,446 in the year 1921-1922.

Fifty-three policyholders in the John Hancock Mutual Life Insurance Company were examined for suspected carcinoma, of which ten were found to be suffering from the disease.

The following table shows the number of cases treated.

<i>Year</i>	<i>Number Patients</i>	<i>O.P.D. Visits</i>	<i>In- patient Days</i>	<i>Operating Expenses</i>	<i>Total Hospital Earnings</i>
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
1917-1918	767†	4,286	6,660	29,791.39	16,006.98
1918-1919	901†	4,420	6,484	33,692.45	20,744.18
1919-1920	1,286†	6,105	7,054	47,361.97	30,147.13
1920-1921	1,420†	6,820	6,511	66,157.03	39,143.41
1921-1922	1,636†	7,331	5,466	65,450.60	46,930.12
1922-1923	1,599†	7,748	6,115	72,332.09	47,714.00

* Old and new patients.

† New patients only.

The classification of new patients presenting themselves at the clinics during the year is presented below in tabular form, arranged according to the classification of diseases adopted by the Boston hospitals and based on the numbers in the International List of Causes of Death.

	<i>Male</i>	<i>Female</i>	<i>Total</i>
CARCINOMA			
Breast. 7-47a	1	91	92

Buccal Cavity. 7-43a			
Cheek.	22	2	24
Jaw, lower.	13	2	15
Jaw, upper.	11	3	14
Lip.	52	8	60
Palate.	7	1	8
Parotid gland.	0	3	3
Tongue and floor of mouth.	55	7	62
Tonsil.	3	0	13
Total. 7-43a	173	26	199

	Male	Female	Total
CARCINOMA (Continued)			
Female Genital Organs.....7-46a			
Cervix uteri.....	0	155	155
Clitoris.....	0	1	1
Ovary.....	0	3	3
Uterus.....	0	23	23
Vagina.....	0	4	4
Vulva.....	0	5	5
Total.....7-46a	0	191	191
Male Genital Organs.....7-49a			
Penis.....	7	0	7
Prostate.....	12	0	12
Total.....7-49a	19	0	19
Peritoneum, Intestines and Rectum, etc...7-45a			
Intestine.....	1	5	6
Rectum.....	19	14	33
Total.....7-45a	20	19	39
Skin.....7-48a			
Arm.....	2	0	2
Back.....	0	2	2
Cheek.....	46	44	90
Chest.....	0	1	1
Chin.....	2	3	5
Ear.....	14	5	19
Eyelid.....	11	5	16
Face.....	2	0	2
Foot.....	1	0	1
Forehead.....	23	18	41
Hand.....	8	0	8
Leg.....	1	2	3
Lip.....	1	0	1
Mastoid region.....	5	0	5
Neck.....	8	1	9
Nose.....	3	53	86
Scalp.....	2	2	4
Total.....7-48a	159	136	295

	Male	Female	Total
CARCINOMA (Continued)			
Stomach, Liver, etc... 7-44a			
Epiglottis.....	3	1	4
Esophagus.....	11	5	16
Gall bladder.....	1	0	1
Liver.....	1	0	1
Nasopharynx.....	0	1	1
Pharynx.....	2	0	2
Stomach.....	9	3	12
Total..... 7-44a	27	10	37

Urinary Organs..... 7-49a			
Bladder.....	6	5	11
Urethra.....	0	1	1
Total..... 7-49a	6	6	12

Other Sites..... 7-49a			
Antrum.....	1	4	5
Branchial cleft.....	1	3	4
Bronchi.....	0	1	1
Ear, canal of.....	0	2	2
Ethmoid.....	1	0	1
Larynx.....	20	0	20
Mediastinum.....	0	1	1
Nose, inside.....	2	2	4
Pancreas.....	1	0	1
Primary site undetermined.....	2	3	5
Thyroid gland.....	3	3	6
Total..... 7-49a	31	19	50

SARCOMA (Unspecified)			
Antrum..... 7-49f	1	0	1
Cerv x uteri..... 7-46f	0	1	1
Fascia..... 7-48f	1	2	3
Kidney..... 7-49f	0	1	1
Multiple..... 7-49f	1	0	1
Orbit..... 7-49f	1	0	1
Ovary..... 7-46f	0	1	1
Retroperitoneum..... 7-45f	1	0	1
Testicle..... 7-49f	2	0	2
Tongue..... 7-43f	1	0	1
Tonsil..... 7-43f	0	1	1

	Male	Female	Total
SARCOMA (Continued)			
Angiosarcoma			
Back.....7-48f	1	0	1
Lip.....7-43f	1	0	1
Chondrosarcoma			
Epiglottis.....7-44f	0	1	1
Fibrosarcoma			
Arm.....7-48f	0	1	1
Foot.....7-49f	1	0	1
Gluteal region.....7-49f	0	1	1
Leg.....7-48f	1	1	2
Neck.....7-49f	1	0	1
Parotid.....7-43f	0	1	1
Shoulder.....7-49f	0	1	1
Giant-cell tumor			
Jaw.....7-43f	0	1	1
Leiomyosarcoma			
Back.....7-48f	1	0	1
Melanotic sarcoma			
Eye.....7-49f	3	0	3
Metastatic.....7-48f	2	0	2
Skin.....7-48f	2	4	6
Myxofibrosarcoma			
Hand.....7-48f	1	0	1
Osteogenic sarcoma			
Femur.....7-49f	2	0	2
Humerus.....7-49f	1	0	1
Rib.....7-49f	0	1	1
Tibia.....7-49f	2	0	2
Total.....	27	18	45

ENDOTHELIOMA			
Orbit.....7-49b	0	2	2
Hemangio-endothelioma			
Back.....7-49b	1	0	1
Total.....	1	2	3

HYPERNEPHROMA			
Kidney.....7-49e	1	1	2
Metastatic.....7-49e	4	0	4
Total.....	5	1	6

	<i>Male</i>	<i>Female</i>	<i>Total</i>
MALIGNANT DISEASE (Unspecified)			
Mediastinum.....7-49	1	0	1
MALIGNANT LYMPHOMA.....7-65.2	19	11	30
Lymphosarcoma.....7-65.2	5	2	7
Total.....	24	13	37
MIXED MALIGNANT GROWTH			
Lacrimal gland.....7-49g	1	0	1
Parotid.....7-43g	1	3	4
Total.....	2	3	5
NON-MALIGNANT TUMORS			
Adenofibroma			
Breast.....7-142	0	1	1
Adenoma			
Ear.....7-86	1	0	1
Prostate.....7-135	1	0	1
Angioma			
Lip.....7-108	3	2	5
Skin.....7-154	5	9	14
Thigh.....7-50	1	0	1
Tongue.....7-108	1	1	2
Angioma cavernosum			
Cheek.....7-154	0	1	1
Ear.....7-86	1	0	1
Leg.....7-154	0	1	1
Chalazion			
Eyelid.....7-154	1	0	1
Cyst			
Lip.....7-108	3	0	3
Ovary.....7-137	0	2	2
Palate.....7-99	1	0	1
Tongue.....7-108	0	1	1
Cyst-adenoma, papillary			
Ovary.....7-137	0	2	2
Epulis			
Jaw.....7-155	1	0	1
Fibroma			
Cheek.....7-154	1	0	1
Fibroma, periductal			
Breast.....7-142	0	3	3
Fibromyoma			
Uterus.....7-139	0	25	25
Glioma			
Eye.....7-85	1	0	1
Orbit.....7-85	1	0	1
Forward.....	22	48	70

	<i>Male</i>	<i>Female</i>	<i>Total</i>
NON-MALIGNANT TUMORS (<i>Continued</i>)			
Brought forward.....	22	48	70
Keloid			
Back.....7-154	0	2	2
Cheek.....7-154	0	1	1
Chest.....7-154	0	2	2
Leg.....7-154	1	0	1
Lip.....7-108	1	1	2
Scalp.....7-154	1	0	1
Lipoma.....7-154	1	4	5
Neuroblastoma			
Adrenal.....7-131	0	1	1
Neurofibroma			
Scalp.....7-154	1	0	1
Osteoma			
Nose.....7-97	1	0	1
Papilloma			
Larynx.....7-98	0	2	2
Lip.....7-108	1	2	3
Mouth.....7-99	1	0	1
Palate.....7-155	0	1	1
Septum, nasal.....7-97	0	1	1
Skin.....7-154	8	8	16
Tongue.....7-108	4	4	8
Polyp			
Cervix uteri.....7-139	0	10	10
Nasopharynx.....7-109	1	0	1
Uterus.....7-139	0	1	1
Wen.....7-154	6	3	9
Total.....	49	91	140

	<i>Male</i>	<i>Female</i>	<i>Total</i>
SPECIAL SKIN DISEASES			
Dermatitis (unqualified).....10-154	1	1	2
Eczema.....10-154	0	1	1
Erythema multiforme.....10-154	1	0	1
Granuloma fungoides.....10-154	0	1	1
Hypertrichosis.....10-154	0	1	1
Keratosis (unqualified).....10-154	73	37	110
Kraurosis.....10-154	0	1	1
Lupus erythematosus.....10-154	4	4	8
Nevus (unqualified).....10-159	2	8	10
Nevus papillaris.....10-159	2	2	4
Nevus pigmentosus.....10-159	3	4	7
Nevus pilosus.....10-159	0	4	4
Nevus vascularis.....10-159	1	1	2
Psoriasis.....10-154	1	0	1
Seborrhea congestiva.....10-154	1	0	1
Sycosis barbæ.....10-154	2	0	2
Sycosis vulgaris.....10-154	1	0	1
Verruca.....10-154	4	10	14
Total.....	96	75	171

	<i>Male</i>	<i>Female</i>	<i>Total</i>
OTHER CONDITIONS			
SECTION I. SPECIFIC INFECTIOUS DISEASES,			
GENERAL DISEASES			
Lupus vulgaris.....I-36	0	1	1
Syphilis.....I-38	7	8	15
Tinea.....I-30	1	0	1
Tuberculoma.....I-36	1	0	1
Tuberculosis			
Kidney.....I-36	0	1	1
Lymph nodes, cervical.....I-36	3	4	7
Rib.....I-36	0	1	1
Skin.....I-36	1	0	1
Ulcer.....I-154	2	0	2
SECTION VI. POISONINGS, INTOXICATIONS			
Lead poisoning.....6-177	1	0	1
SECTION VIII. CONGENITAL MALFORMATIONS			
Branchial cyst.....8-159	1	1	2
Pilonidal sinus.....8-159	1	0	1
Thyro-glossal cyst.....8-159	1	0	1
SECTION IX. INJURIES			
Fracture			
Clavicle.....9-188-3	0	1	1
SECTION XI. DISEASES OF THE CIRCULATORY			
SYSTEM			
Arteriosclerosis.....11-91	1	0	1
Varix.....11-93	0	1	1
SECTION XII. DISEASES OF THE LYMPHATIC			
SYSTEM			
Lymphadenitis.....12-94	0	1	1
SECTION XIII. DISEASES OF THE BLOOD AND			
BLOOD-FORMING ORGANS			
Banti's disease.....13-58	1	0	1
Hemophilia.....13-69	1	0	1
Leukemia, lymphoid.....13-65.1	2	0	2
Leukemia, myeloid.....13-65.1	4	3	7
Mononucleosis.....13-65	1	0	1
SECTION XIV. DISEASES OF THE DUCTLESS			
GLANDS			
Adenoma, pituitary gland.....14-59	1	1	2
Goitre.....14-60	0	1	1
SECTION XV. DISEASES OF THE NERVOUS			
SYSTEM			
Mastodynia.....15-82	0	4	4
Neuralgia.....15-82	0	1	1
Vertigo.....15-84	1	0	1
Forward.....	31	29	60

	Male	Female	Total
OTHER CONDITIONS (<i>Continued</i>)			
Brought Forward.....	31	29	60
SECTION XVI. DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS AND FASCIA			
Arthritis, hypertrophic.....16-156	3	0	3
Osteomyelitis.....16-155	0	1	1
SECTION XVII. DISEASES AND INJURIES OF THE EYE AND EAR			
Separation of retina.....17-85	1	0	1
SECTION XVIII. DISEASES OF THE NOSE AND ACCESSORY SINUSES			
Deviation of nasal septum.....18-97	1	1	2
Rhinitis, acute.....18-97	1	0	1
Rhinitis, chronic.....18-97	0	2	2
Ulcer of nose.....18-97	0	1	1
SECTION XIX. DISEASES OF THE MOUTH, LIPS, CHEEKS, PHARYNX, TONSILS AND PALATE			
Fissure of lip.....19-108	1	1	2
Inflammation			
Lip.....19-108	1	0	1
Palate.....19-109	0	1	1
Leukoplakia of mouth.....19-108	11	1	12
Pharyngitis, chronic.....19-109	2	0	2
Stomatitis, ulcerative.....19-108	1	0	1
Tonsillitis, chronic.....19-109	0	3	3
Other diseases of the mouth.....19-108	0	1	1
SECTION XX. DISEASES OF THE JAW, TEETH AND GUMS			
Caries of teeth.....20-108	2	0	2
Gingivitis.....20-108	0	1	1
Pyorrhea alveolaris.....20-108	0	2	2
Ulcer of gum.....20-108	0	1	1
SECTION XXI. DISEASES OF THE TONGUE			
Glossitis.....21-108	1	2	3
Leukoplakia of tongue.....21-108	3	1	4
Ulcer of tongue.....21-108	1	1	2
Other diseases of tongue.....21-108	2	1	3
SECTION XXIII. DISEASES OF THE STOMACH			
Gastroptosis.....23-112	0	1	1
Hyperchlorhydria.....23-112	1	1	2
Pylorospasm.....23-112	1	0	1
Ulcer of stomach.....23-111	1	2	3
Forward	65	54	119

	Male	Female	Total
OTHER CONDITIONS (<i>Continued</i>)			
Brought Forward.....	65	54	119
SECTION XXIV. DISEASES OF THE INTESTINES			
Colitis.....24-114	1	0	1
Constipation.....24-119	3	2	5
Stasis, intestinal.....24-119	0	2	2
Ulcer, duodenal.....24-111	3	3	6
SECTION XXV. DISEASES OF THE LIVER AND GALL DUCTS			
Cholelithiasis.....25-123	0	1	1
Jaundice, hemolytic.....25-124	1	0	1
SECTION XXVII. DISEASES OF THE ABDOMEN AND PERITONEUM IN GENERAL			
Adhesions, pelvic.....27-126	0	1	1
Hernia, umbilical.....27-118.1	0	1	1
SECTION XXVIII. DISEASES OF THE RECTUM AND ANUS			
Fissure of anus.....28-119	0	1	1
Hemorrhoids.....28-93	0	3	3
Pruritus ani.....28-154	2	1	3
SECTION XXX. DISEASES OF THE TRACHEA AND BRONCHI			
Asthma.....30-105	0	1	1
Bronchitis (unqualified).....30-99	0	2	2
Bronchitis, chronic.....30-99.2	1	0	1
SECTION XXXIII. DISEASES OF THE KIDNEY AND URÉTER			
Nephrolithiasis.....33-132	1	0	1
Nephroptosis.....33-131	0	1	1
SECTION XXXV. DISEASES OF THE URETHRA, MALE AND FEMALE			
Prolapse of urethra.....35-134	0	1	1
SECTION XXXVI. DISEASES OF THE MALE GENERATIVE ORGANS			
Epididymitis.....36-136	1	0	1
Fibrosis of corpora cavernosa.....36-136	2	0	2
Phimosis.....36-136	1	0	1
SECTION XXXVII. DISEASES OF THE FEMALE GENERATIVE ORGANS			
Bartholinitis.....37-141	0	1	1
Cyst of Bartholin's gland.....37-141	0	1	1
Endocervicitis.....37-141	0	10	10
Endometritis, chronic.....37-141	0	14	14
Erosion of cervix uteri.....37-141	0	2	2
Fibrosis of uterus.....37-141	0	3	3
Forward	81	105	186

	Male	Female	Total
OTHER CONDITIONS (<i>Continued</i>)			
Brought Forward.....	81	105	186
Fistula, recto-vaginal.....37-119	0	1	1
Laceration of cervix uteri (old).....37-141	0	1	1
Laceration of cervix uteri & pelvic floor 37-141	0	2	2
Laceration of pelvic floor (old).....37-141	0	2	2
Menopause.....37-141	0	1	1
Menorrhagia.....37-140	0	2	2
Pruritus vulvæ.....37-154	0	1	1
Salpingitis, chronic.....37-138	0	4	4
Other diseases of vulva.....37-141	0	3	3
SECTION XXXVIII. PUERPERAL STATE			
Pregnancy, normal.....38-	0	1	1
SECTION XXXIX. DISEASES OF THE BREAST, MALE AND FEMALE			
Cystic disease of breast.....39-142	0	13	13
Mastitis.....39-142	1	3	4
Other diseases of the breast.....39-142	0	1	1
SECTION XLI. ILL-DEFINED OR UNCLASSIFIED DISEASES			
No diagnoses.....41-205	7	10	17
No disease.....41-	3	14	17
Phantom tumor of breast.....41-205	0	1	1
Total.....	92	165	257

CARCINOMA

Breast.....	92
Buccal Cavity.....	199
Female Genital Organs.....	191
Male Genital Organs.....	19
Peritoneum, Intestines and Rectum, etc.....	39
Skin.....	295
Stomach, Liver, etc.....	37
Urinary Organs.....	12
Other Sites.....	50
	934
Carcinoma.....	934
Sarcoma.....	45
Other Malignant Tumors.....	52
Non-Malignant Tumors.....	140
Special Skin Diseases.....	171
Other Conditions.....	257
	1,599

The assignment of groups of cases to different members of the staff has been continued. Dr. Leland has seen all the cases of carcinoma of the female genital organs for the past three years. These cases will now be taken care of under his supervision by Dr. Davis, and he will devote his time to the study of material collected.

Several semi-public and private clinics and meetings have been held at the hospital during the past year. These are as follows: October 1922, clinic for the Surgical Congress of American College of Surgeons; November 1922, two clinics for Massachusetts physicians during Cancer Week; December 1922, a clinic for the Cosmopolitan Medical Club; February 1923, a clinic for the Norfolk District Medical Society; April 1923, a clinic for the Tri-State District Medical Association; March 1923, the Society for Cancer Research held a two-day meeting at the hospital as guests of the Cancer Commission. The State League of Nursing Education holds its monthly meeting in the solarium.

Miss Marian Colburn, the Social Service Worker, resigned in March in order to accept another position and her place has not yet been filled. While the services of a social service worker are needed for at least part time, most of the patients who are in need of aid are in touch with similar workers in other institutions.

The regular out-patient clinics have been conducted as in previous years and are as follows:

Monday afternoon.	Diseases of the blood and lymph glands.
Tuesday afternoon.	General surgical clinic.
Wednesday afternoon.	Carcinoma of the nose and throat.
Thursday morning.	Carcinoma of the genito-urinary organs.
Thursday afternoon.	Carcinoma of the female genital organs.
Friday afternoon.	General surgical clinic.

Seven hundred and twenty-one surgical operations were performed in the hospital during the past year. Many of these operations represent the treatment of carcinoma by a combination of surgery and radiation. A few cases of carcinoma requiring purely surgical treatment were cared for at the hospital but the majority of such cases examined in the out-patient clinic were referred to other institutions.

The hospital, through individual members of the staff, is taking an active part in the collection and tabulation of cases

of cancer of the uterus, buccal mucosa and breast from the various clinics throughout the United States, which is being inaugurated by the College of Surgeons. It is expected that the large amount of material thus collected and studied will be of considerable aid in determining the treatment to pursue in the different types of cases and will be a point of departure for future investigation.

The surgeon wishes to express his appreciation to members of the staff, the administration, and the nurses for their coöperation and devotion to the work. It has made it possible to handle the large clinics in a satisfactory manner.

Respectfully submitted,

CHANNING C. SIMMONS,
Surgeon.

July 1, 1923.

REPORT OF THE PHYSICIAN
TO THE
CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: The progressive study and treatment of cases of leukemia and allied conditions has been continued. It has been definitely established that critical blood examination evaluated with the basal metabolic rate serves as a most important guide to the treatment of such cases.

More marked improvement than ever observed before has occurred in several cases of erythremia following very large doses of radium or Roentgen ray. This is in accord with recent reports in the German literature. Five previously untreated cases of myelogenous leukemia have received irradiation from the new X-ray apparatus. They have all shown a most extraordinarily rapid improvement. Critical studies on their blood have been made.

A constantly increasing number of atypical blood conditions are being observed. The blood picture of Hodgkin's disease and other cases showing increases of large mononuclear cells has been and still is the subject of a routine critical study. Likewise there is being conducted a more detailed survey, than heretofore, of the blood of workers exposed to irradiation.

Doctors Minot and Buckman have continued to analyze the records of over two hundred cases of myelogenous leukemia with secretarial help enabled by a grant from the Proctor Fund. It will be some time yet before this survey of cases is completed.

There has been made a collection of colored lantern slides to illustrate how the histology of the blood serves as a guide in the treatment and prognosis of myelogenous leukemia.

Doctors Minot and Buckman have completed a series of studies on erythremia and presented the same before the Association of American Physicians.

Dr. Minot, with Dr. J. H. Means, has analyzed the relationship of the basal metabolism, pulse rate and size of the heart in myelogenous leukemia with the same in hyperthyroidism. They presented this study before the American Society for Clinical Investigation. At the same meeting, Dr. Buckman

reported important experiments concerning the chloride content of the erythrocytes. The results are helpful in understanding cellular biology.

The two following papers were published during the year.

1. "Megacaryocytes in the Peripheral Circulation," G. R. Minot, *Journal of Experimental Medicine*, vol. 35, p. 1, 1922.
2. "Rouleaux Formation of Red Cells in Various Types of Disease," D. B. Swift, *Journal of Laboratory and Clinical Medicine*, vol. 7, No. 10, 1922.

An important part of the year's work has been the study and collection of much data concerning the effect of short wavelength Roentgen ray therapy on the blood. The important effect is the production of leucopenia that may last for weeks. This work has particularly been done by Dr. R. G. Spurling with the help of Miss Daland and Miss Weld. These studies are being continued. The observations suggest that a biological standard for measuring dosage may be of fully as great value as physical methods.

Dr. Hitchcock, as Resident Physician, in addition to his routine duties has continued studies on the basal metabolism of lymphatic leukemia. A grant from the Proctor Fund has permitted the purchase of a metabolimeter.

During the past year, the addition of Miss Daland and Miss Weld to the personnel is noteworthy. It is to be recognized that they qualify not only as expert technicians but as assistant investigators. They have enabled the satisfactory accomplishment of the increasing routine work and some of the studies referred to above. In addition, they have made supplementary observations to those begun some years ago with platelets in leukemia. Some weeks of their time were spent in learning special procedures under Dr. Buckman's supervision. They have accomplished also a considerable amount of work along various lines that is still in progress. The studies include observations on the phosphorus of the blood in disease and its alteration by radiation, the inhibition of plant root growth by sera, etc.

The plans for development of the Medical Department in the ensuing year offer opportunity for a desirable increase of its activities, particularly through a larger personnel. Clinical investigation will form an important part of the department's

work as well as an increase of routine. Teaching undergraduate medical students will be a feature. The first step towards expansion has consisted of the opening in January of a new laboratory and the establishment of an office for the department. The equipment of the laboratories is most satisfactory. Dr. Minot has devoted since January an increased amount of time to the hospital, spent particularly in organizing the new laboratory, making arrangements for the new personnel and planning for the future developments. He is to omit his routine service and investigations at the Massachusetts General Hospital and thus be enabled to give considerable time to promoting this Department of Medicine that will be conducted with coöperation from that of the Medical School and Medical Services of the chief hospitals affiliated with the School.

Dr. Buckman's aid in some of the arrangements for investigations and organization is noteworthy. The department is fortunate in his having been enabled to give more time to the hospital and to fill a new position. As Assistant Physician, he is to develop and be in charge of a clinic for children, and conduct, aid and advise in investigative problems.

Dr. Raphael Isaacs is to be Assistant Physician and is Instructor in Medicine in the Medical School. His whole time will be devoted to routine, investigation, and teaching. His previous progressive work fits him for undertaking problems concerning cellular biology.

A full-time Resident Physician is a further desirable addition to the personnel. Dr. D. R. Higbee will fill this position until March when Dr. R. R. Hippensteel will begin his service.

During the summer months Dr. John S. Lawrence is to make special investigations.

In addition to the above personnel, two other investigators will be associated with the department. One, Dr Hitchcock, as Assistant in Medicine, is to continue his studies on basal metabolism. He is enabled to do so by a scholarship granted by the Proctor Fund. The other is Mr. Pearse, a third-year medical student. He has been given a special scholarship provided by the Proctor Fund for "a medical student to undertake investigations under the direction of the Medical Service of the Huntington Hospital."

The problems now being studied will be continued and

expanded. Studies appertaining to the chemotherapy of malignant disease seem desirable ones to foster. The staff, besides undertaking laboratory problems, will make clinical observations on an increasing number of cases with a view to more fully comprehending the nature of disease processes and their early diagnosis.

The staff could study with profit a few cases for diagnosis. A small diagnostic clinic, admitting patients by appointment, is to be considered.

It is hoped that, with the expansion and reorganiza tion of the Medical Department, the ensuing year will mark the beginning of a period of further profitable progressive action.

Respectfully submitted,

GEORGE R. MINOT, M.D.,
Physician.

July 1, 1923.

REPORT OF THE MATRON-SUPERINTENDENT
TO THE
DIRECTOR OF THE CANCER COMMISSION OF
HARVARD UNIVERSITY

DEAR SIR: I have the honor to submit the eleventh report of this hospital for the year ending June 30, 1923.

The number of in-patient days during the year has been less by 17 than in the preceding year; the number of days' care greater by 649. The number of out-patient visits was 7,748, an increase of 417 over the preceding year.

RECEIPTS — The income of the hospital has been increased, due largely to the change of method of collecting accounts for hospital service rendered. Formerly, bills were not rendered until the end of the month, or when a patient left the institution. As a result, a large amount of the hospital earnings remained outstanding, unpaid. The system of collecting a deposit in advance was put into operation, and the amount of outstanding accounts has been greatly reduced. It has been the policy of the hospital to collect from patients whatever they could afford to pay, and to make adjustments of rates for care and treatment where there is a genuine need, and in many cases lengthened time has been given in which to make payments. No patient is refused care or treatment if unable to pay. The total number of patients admitted during the year was 1,264; 917 paid less than \$21 per week; 244 paid \$21 or more per week; and 103 were treated free of charge.

NURSING — The establishment of the Deep Therapy Clinic made it necessary to add two more nurses to our staff. The year ended with the following staff of nurses on duty:

Matron-Superintendent	1
Assistant Matron-Superintendent.....	1
Head Nurses.....	2
Night Supervisor.....	1
Graduate Nurses (floor duty).....	3
Attendants (floor duty).....	7
Total.....	15

The reception room for the nurses has been greatly enjoyed. We are indebted to Mr. Walter Hughes for installing a radio

set in this room. This room has also been used throughout the year for special meetings of the Cancer Commission and for the monthly meetings of the Massachusetts State League of Nursing Education.

LABORATORY COURSE FOR TECHNICIANS—In 1913 a course in Laboratory Technic was inaugurated. Fifty-five students have completed the course, and with the exception of five who have married, and two who entered medical schools, the graduates are actively engaged in this work in various hospitals. The results have been gratifying and we expect to continue this teaching during the coming year. The demand for the services of the graduates greatly exceeds the supply.

There have been eight deaths in the hospital. Autopsies were performed on five.

Operations were performed during the year as follows:

OPERATIONS FOR 1922-1923

Carcinoma		
Breast		
Amputation.....	2	
Excision of tumor.....	1	
Excision and dissection of axilla.....	1	
Buccal Cavity		
Cheek		
Excision and cauterization.....	4	
Jaw		
Curettage and radium treatment.....	3	
Excision and cauterization.....	4	
Lip		
Excision.....	10	
Excision and dissection of neck.....	1	
Mouth, floor of		
Excision and cauterization.....	3	
Palate		
Radium treatment.....	2	
Tongue		
Excision and cauterization.....	7	
Excision and radium treatment.....	7	
Incision and drainage of broken down cervical lymph nodes.....	1	
Radium treatment.....	1	
Tracheotomy and radium treatment.....	1	
Female Generative Organs		
Cervix		
Curettage and radium treatment.....	146	
Cystoscopy.....	1	
Ether examination.....	2	
Uterus		
Curettage and radium treatment.....	19	
Ether examination.....	1	

Vagina	
Curettage and radium treatment.....	1
Radium treatment.....	3
Vulva	
Curettage and radium treatment.....	1
Radium treatment.....	7
Vulvectomy with drainage.....	1
Male Generative Organs	
Penis	
Amputation of penis and scrotum and dissection of groins.....	1
Prostate	
Cystoscopy.....	5
Prostatectomy.....	3
Suprapubic cystotomy.....	2
Peritoneum, Intestines and Rectum	
Rectum	
Colostomy.....	3
Radium treatment.....	19
Skin	
Amputation of finger.....	1
Excision.....	60
Plastic operation.....	2
Stomach, Liver, etc.	
Epiglottis	
Laryngoscopy and radium treatment.....	5
Esophagus	
Esophagoscopy and radium treatment.....	20
Laryngoscopy and radium treatment.....	3
Tracheotomy for dyspnea.....	1
Stomach	
Esophagoscopy and radium treatment.....	1
Urinary Organs	
Bladder	
Cystoscopy.....	17
Cystotomy and radium treatment.....	2
Hemicystectomy with implantation of ureter.....	1
Plastic operation.....	1
Regions not Elsewhere Mentioned	
Antrum	
Resection.....	1
Larynx	
Laryngoscopy and radium treatment.....	10
Thyrotomy and excision.....	1
Tracheotomy.....	8
Orbit	
Exenteration.....	5
Endothelioma, hemangio	
Leg	
Excision.....	1
Lymphoma, malignant	
Partial dissection of neck.....	1
Radium treatment.....	1
Sarcoma	
Cervix	
Curettage and radium treatment.....	1
Angiosarcoma	
Lip	
Excision.....	1

Fibrosarcoma	
Labium	
Excision of clitoris and labia.....	1
Osteogenic sarcoma	
Femur	
Amputation of thigh.....	1
Incision and drainage of cystic area.....	1
Melanotic sarcoma	
Skin	
Excision.....	2
Non-Malignant Tumors	
Adenofibroma	
Breast	
Excision.....	1
Adenoma	
Prostate	
Cystoscopy.....	1
Angioma	
Lip	
Excision.....	5
Cyst	
Nasopharynx	
Excision.....	1
Cystic disease	
Breast	
Excision.....	1
Cystadenoma	
Ovary	
Radium treatment.....	2
Fibroma	
Cheek	
Excision.....	1
Fibromyoma	
Uterus	
Curettage and radium treatment.....	14
Keloid	
Arm	
Excision.....	1
Papilloma	
Bladder	
Cystoscopy.....	1
Larynx	
Laryngoscopy.....	3
Skin	
Excision.....	5
Tongue	
Excision.....	2
Polyp	
Cervix	
Curettage and radium treatment.....	7
Dilatation and curettage.....	1
Wen	
Excision.....	5
Special Skin Diseases	
Keratosi	
Lip	
Excision.....	2

Nevus	
Lip	
Excision.....	3
Verruca	
Ear	
Excision.....	4
Other Conditions	
Abscess	
Incision and drainage.....	2
Endocervicitis	
Dilatation and curettage.....	1
Ether examination.....	1
Trachelorrhaphy.....	1
Endometritis and endocervicitis	
Curettage and radium treatment.....	13
Trachelorrhaphy.....	1
Erosion	
Cervix uteri	
Trachelorrhaphy.....	2
Fibrosis	
Uterus	
Curettage and radium treatment.....	4
Fistula	
Bladder	
Cystoscopy.....	1
For diagnosis	
Cystoscopy.....	3
Ether examination.....	4
Removal of specimen.....	192
Granulating wound	
Skin grafting.....	5
Hemorrhage	
Ligation of artery.....	3
Leukoplakia	
Tongue	
Excision.....	2
Lupus vulgaris	
Excision.....	1
Menorrhagia	
Curettage and radium treatment.....	2
Necrosis	
Cartilage	
Excision.....	1
Ear	
Excision.....	1
Jaw	
Excision.....	1
Phimosis and balanitis	
Circumcision.....	1
Prolapse	
Urethra	
Cystoscopy.....	1
Radium burn	
Foot	
Excision.....	1
Stricture	
Esophagus	
Ether examination.....	1

Ulcer	
Jaw	
Excision.....	1
Prepuce	
Circumcision.....	1
Tongue	
Excision.....	2
Total.....	<hr/> 721

SOCIAL SERVICE — Our Social Service Worker, Miss Marian Colburn, who has given such efficient service in this department, left us in February, to accept a more responsible position. The department has continued its usual activities and the work has been carried on by the Assistant Matron, Miss Myra B. Conover. Intensive follow-up work has been continued and of the 1,725 letters sent out, 70 per cent have been answered either in person or by letter.

ACKNOWLEDGMENTS — We desire to express our appreciation of the many kind attentions of friends.

Dr. and Mrs. J. Collins Warren.....	Hospital utensils, linen and furniture
Dr. R. B. Greenough.....	Books
Dr. and Mrs. C. C. Simmons.....	Books and decorating Christmas tree for nurses
Mrs. Moses Williams.....	Flowers
Mr. Roland Thorpe.....	Flowers
Dr. W. M. Shedden.....	Books and gramophone records

The nurses and employees throughout the hospital have labored earnestly and faithfully in the discharge of their duties, and there have been few changes among them.

The District Nurses' Association has continued to coöperate with the hospital and has given excellent care to our out-patients.

Respectfully submitted,

July 1, 1923.

ANNA L. GIBSON, R.N.

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

GENTLEMEN: I have the honor of presenting the following report.

The radium plant has been operating in a routine manner and we have been preparing emanation applicators for our own clinics as well as for the Massachusetts General Hospital, whenever it has sent for its share of emanation.

The emanation pumps contain, at present, about one gram of radium belonging to the Cancer Commission and about one-fourth gram belonging to the Massachusetts General Hospital.

In the X-ray Department, we have been investigating and remedying certain defects of insulation in the power plant which developed after prolonged use during the hot weather of the summer of 1922. We have succeeded in replacing certain highly insulated bushings which gave out, by oil insulation of our own design, which appears to work perfectly satisfactorily. The power plant itself has been running since last fall without breakdowns and without repair work being necessary.

We have been having considerable difficulty with the X-ray tubes. These tubes vary very much among themselves in the lengths of their lives. Some tubes last a few days and others several weeks or months.

At first we put too much power into the tubes and none of them would stand up under the severe heating, but by cutting down the power delivered to the tube to about one-half of its initial value we have found that some tubes last a long time. This materially reduces the average cost of a treatment. This has made it necessary in order to give the patient the same total dose of X-rays as used at first, to increase the length of treatments proportionally.

This decrease in the intensity of radiation and the increase in the time seems to act favorably on the nauseating effects of the treatments. Patients appear, on the average, to be less nauseated when subjected to the lower intensities of X-radiation.

We have been attempting to get as accurate an estimate as possible of what is known as the erythema dose. It appears that even when we measure the X-radiation delivered to the patient very carefully, there is a considerable variation in the magnitude of the total dose required to produce the erythema. This variation undoubtedly comes from differences in the biological conditions of the skins of different patients. It cannot be due to variations in the amount of radiation received.

Comparing our value of the erythema dose with that obtained elsewhere by the same method of measurement, it seems as if the erythema effect is not proportional to the product of the intensity of the radiation multiplied by the time. The total dose (intensity multiplied by time) is larger if the intensity factor is smaller, and the time factor correspondingly larger, than it is if the reverse holds true.

An important point now remains to be determined; namely, whether the destructive effect on pathological tissues follows the same law. Doubling the time of treatment doubles the average expense of treatment. In order to overcome this difficulty we have arranged to operate two tubes at one time from the plant.

In order to get a satisfactory estimate of the amount of relief that the penetrating X-rays are capable of giving patients, it will be necessary to extend the series of treatments over a long period of time and obtain the opinions of a number of members of the clinical staff.

At present there are no methods of accurately measuring the clinical effects produced by the radiation.

Respectfully submitted,

WILLIAM DUANE.

July 1, 1923.

REPORT OF THE
RESEARCH FELLOW IN BIO-PHYSICS
TO THE

CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: I have the honor of presenting the following report of the activities in my laboratory during the last year.

Instruction in Bio-physics has continued to demand much of my personal attention. That we are meeting with success is evidenced by the fact that though the course which previously has extended throughout the year was this year given during the first semester, very nearly all of the students petitioned the faculty that it be continued.

Besides the Bio-physics course offered in Harvard University, I have given a series of lectures to students in the School of Tropical Medicine on the Biological Effects of Rays and have taken part in the instruction in the Bio-physics course offered to fourth-year students in the Harvard Medical School.

In addition to the lectures regularly offered in courses of instruction I have read lectures before a number of scientific societies. These lectures have, I think, been very useful in directing the attention of men of scientific training to the importance of the field of Bio-physics and will undoubtedly be useful in procuring the establishment of chairs of Bio-physics in other institutions.

ELECTRIC RESPONSE OF THE RETINA AND OPTIC NERVE WHEN STIMULATED BY LIGHT — The experimental work of the year has been devoted largely to the investigation of the effects of varying the color of the stimulating light on the electrical response of the frog's retina. This necessitated spending considerable time in construction and calibration of new color apparatus.

The results obtained may be summarized as follows:

The color sensitivity curve of the frog's eye for constant energy has been obtained. The curve is quite different from that for the human eye in that the sensitivity for the violet end of the spectrum is relatively much greater. This curve has a different shape for each different constant value of the

energy, the main point of difference being a shift of the maximum toward the blue as the intensity is decreased.

INTERFACIAL POTENTIALS — Mr. Walter S. Hughes has assisted in conducting the Bio-physics course in Cambridge and has extended his investigations of the potential differences which exist on the two sides of thin glass walls in contact with electrolytes on either side; and has, by connecting this up with diffusion potentials, been able to develop a physical device which is capable of simulating the so-called electrical organs of the electric eel and the electric ray — and it seems probable that the potentials developed in these organs are developed in the manner suggested by his experiments. These investigations are of value to physiologists in connection with the generation of bio-electric currents wherever found.

FORESTRY RESEARCH — The amount of light necessary for tree seedlings and the effects of thinning and clearing processes in forestry management as they change the amount of light falling on the ground or on the low vegetation of the forest floor and the further indirect effects of these thinning and clearing processes on the physical character of the forest soil have been subjects of much academic discussion. There is, however, a most conspicuous lack of reliable data. Mr. Gast has been devising suitable methods of measuring light in forestry research.

Work has been started on the construction of apparatus for measuring soil moisture and the determination of soil acidity. Studies of some of the colloidal properties of the soil have been undertaken. These investigations have been financed by the Harvard School of Forestry and the field work is being conducted in coöperation with the Harvard School of Forestry at the Harvard Forest in Petersham.

THE PASSAGE OF BACTERIA THROUGH TISSUE MEMBRANES — Dr. Stuart Mudd has continued the study of electro-capillary effects in relation to the general question of intra-cellular and inter-cellular dynamics and to the particular problem of filtration through Berkefeld candles.

The filterable microörganism *V. percolans* (diameter about 0.36μ) has been shown normally to pass through Berkefeld V filters, but not through filters of the N or W type. *V. Cholerae* (diameter 0.46μ) is not a filter passer. *V. percolans* has been

stained and photographed in the intergranular spaces of the filters. The average intergranular diameter of all three types of filter has been determined as about 0.4μ . Evidently, then, the excess of coarse pores in the V type of filter as compared with the N or W type may be a critical factor in filterability.

In collaboration with Mr. Shields Warren the migration of bacteria through sand has been studied. By continued selection of those organisms which pass through most rapidly, a high degree of motility characteristic for each species has been developed. The bacterial migration has been shown to be determined by the available food supply.

ULTRA-VIOLET COAGULATION OF EGG WHITE — Mr. Woolpert is continuing the investigation of the photo-chemical changes produced in proteins by ultra-violet radiation. An exposure to ultra-violet radiation alters the protein in such a manner that it coagulates at lower temperatures than unexposed protein. The coagulation is influenced by the degree of dissociation of the protein.

THE PHYSIOLOGICAL EFFECTS OF ULTRA-VIOLET LIGHT — The one thing that perhaps has most seriously stood in the way of understanding cancerous growths has been the lack of specific knowledge of the nature of protoplasmic organization. I believe that distinct progress has been made by Prof. C. E. Barr during the last year in developing and testing out such a mechanism. While it is undoubtedly premature to intimate that a complete solution of this problem of cell organization has been reached, it is only fair to state that a number of competent critics in the fields of physics, colloidal chemistry and of biology have expressed their approval of it.

It has been demonstrated by Child, Hyman and others, that tissue dominance, which is one of the cardinal principles that must be considered in cancerous growth, is associated closely with an increase of metabolic activity, and that those tissues that are especially active in their metabolic processes are more readily acted upon by stimulating or by destructive agents.

This is found to be true when organisms were exposed to the radiations of ultra-violet light. In an amœba disintegration begins at that point that was most active at the moment radiation commenced, and, if the whole organism is exposed to the radiation, the wave of disintegration rapidly, though somewhat

irregularly, extends throughout the regions of less and less activity.

The phenomena that have been observed lead us to believe that the organization of protoplasm has its origin in the orientation (or polarization) of the molecules at the interfaces of the protoplasmic constituents — and that this organization is broken down under this radiation.

In view of the facts stated above, whatever be the fate of the suggested theory, the biological effects of rays is a matter that merits and demands serious consideration.

Respectfully submitted,

July 1, 1923.

W. T. BOVIE.

REPORT OF THE STATE DIAGNOSIS SERVICE FOR THE YEAR ENDING JUNE 30, 1923

The number of specimens received for examination and diagnosis during the year ending June 30, 1923, was 2,155. Of the 2,155, 611 came from the Huntington Hospital, as compared with 683 for the previous year, a decrease of 72, and 1,544 came from outside, as compared with 1,499 for the previous year, an increase of 45.

Of the 1,544 specimens from outside, a large proportion were marked as originating in certain hospitals, but others undoubtedly came from operations in hospitals without this being indicated. Also, many specimens came from hospitals without indicating the surgeon's name. For these reasons the data given below are necessarily approximate.

The hospitals from which specimens were marked as originating, other than the Huntington Hospital, are as follows:

Addison Gilbert Hospital, Gloucester
 Alley, Mary A., Emergency, Marblehead
 Angel Memorial Hospital, Boston
 Beverly Hospital
 Brockton Hospital
 Burbank Hospital, Fitchburg
 Cable Memorial Hospital, Ipswich
 Cape Cod Hospital, Hyannis
 Charlesgate Hospital, Cambridge
 Chelsea Memorial Hospital
 Choate Memorial Hospital, Woburn
 Clinton Hospital
 Cooley Dickinson Hospital, Northampton
 Fall River Hospital
 Farren Memorial Hospital, Montague
 Framingham Hospital
 Gale Hospital, Haverhill
 Hahnemann Hospital, Worcester
 Hale Hospital, Haverhill
 Henry Heywood Memorial Hospital, Gardner
 Hillcrest Hospital, Pittsfield
 Holyoke City Hospital
 Leominster Hospital
 Leonard Morse Hospital, Natick
 Malden Hospital
 Middlesex Hospital, Cambridge
 Milford Hospital
 Millers River Hospital, Winchendon
 Moore Hospital, New Bedford
 Morton Hospital, Taunton

New England Sanitarium, Melrose
 Newton Hospital
 Norfolk County Hospital, South Braintree
 House of Providence Hospital, Holyoke
 Quincy City Hospital
 Salem Hospital
 Somerville Hospital
 State Infirmary, Tewksbury
 St. Luke's Hospital, Boston
 Sturdy Memorial Hospital, Attleboro
 Taunton State Hospital
 Thomas, J. B., Hospital
 Union Hospital, Lynn
 Union Hospital, New Bedford
 Waltham Hospital
 Wesson Memorial Hospital, Springfield
 Weymouth Hospital
 Whidden Memorial Hospital, Everett

The number of surgeons or other persons whose names were given as senders of specimens, exclusive of specimens from the Huntington Hospital, is 314.

The great majority of the senders of specimens are located outside of Boston and adjoining towns. From this it would seem that the facilities of the Diagnosis Service for the microscopical examination of tumors reach communities which it is especially desirable to serve.

The preparation of microscopical sections of specimens, by the method of freezing with carbon dioxide, was abandoned, as a routine, during the year, and the paraffin imbedding method adopted. By the use of acetone for dehydrating, the usual time required for obtaining paraffin imbedded sections has been shortened, thus facilitating the prompt rendering of reports of microscopic examinations.

Dr. Trevor G. Browne, Research Fellow in Pathology, has given valued assistance in carrying on the work of the Free Diagnosis Service.

Respectfully submitted,

J. HOMER WRIGHT, M.D., D.Sc.,
Pathologist in charge of Free Diagnosis Service.

July 1, 1923.

REPORT OF THE TREASURER TO THE CANCER COMMISSION OF HARVARD UNIVERSITY

GENTLEMEN: I have the honor to submit to you my report for the year ending June 30, 1923.

Contributions to the funds of the Cancer Commission have been received by the Treasurer of Harvard College between July 1, 1922, and June 30, 1923, amounting to \$177,210. Of this amount \$46,416.40 was used for current expenses and \$130,793.60 was added to the invested funds.

The Treasurer of Harvard College on July 1, 1923, held the following special funds for the benefit of the Cancer Commission of Harvard University:

Francis Bartlett Free Bed Fund.....	\$5,000.00
Memorial Cancer Hospital Endowment Fund.....	117,748.24
T. Jefferson Coolidge Fund for Cancer Research.....	2,000.00
Caroline Brewer Croft Fund.....	92,025.00
William Endicott Fund.....	25,000.00
L. C. Fenno Fund — Treatment by Light Rays.....	20,000.00
Lawrence Carteret Fenno Free Bed Fund.....	5,000.00
Franklin H. Hooper Free Bed Fund.....	5,000.00
Amos Lawrence Hopkins Free Bed Fund.....	5,000.00
Marian D. Lockwood Memorial Fund.....	50,728.58
Julia M. Moseley Fund.....	23,250.00
George von L. Meyer Bequest.....	2,500.00
Clara Endicott Payson Free Bed Fund.....	5,000.00
Emily J. Proctor Gift.....	3,054.12
Gifts for Research in Genetics.....	320.00
F. D. Moulton Gift for Social Workers.....	400.21
James Ewing Mears Bequest.....	9,295.01
Collis P. Huntington Memorial Hospital New Endowment.....	500.00
Dudley B. Fay Memorial.....	2,000.00
David Pingree.....	1,000.00
Charles S. Fairchild.....	5,000.00
Elizabeth Worcester Mills.....	100,000.00
Henry O. Underwood.....	10,000.00
	<hr/>
	\$489,821.16

This amount is to be compared with the total of \$359,871.06 in last year's report, showing an increase in the invested funds of the Commission of \$129,950.10.

The list of subscribers to the Cancer Commission of Harvard University in 1922-1923 is as follows:

GIFTS FOR CAPITAL

The Charles S. Fairchild Fund.....	\$5,000.00
Charles S. Fairchild	
John Hancock Mutual Life Insurance Company.....	20,000.00
"Elizabeth Worcester Mills Fund".....	100,000.00
Hiram F. Mills, Estate of:	
On account of his bequest of \$200,000, "in memory of my beloved wife, Elizabeth Worcester Mills — to be known forever as the 'Elizabeth Worcester Mills Fund,' the income . . . to be devoted to the investigation of the origin and cure of cancer . . . "	
Henry O. Underwood, Estate of.....	10,000.00
His bequest, "the income to be used in such manner as the President and Fellows of Harvard College may determine for the maintenance of the Cancer Hospital maintained in connection with the Harvard Medical School, or for experimental or research work in connection with said Cancer Hospital, or in case at any time in the judgment of the President and Fellows of Harvard College said income is not needed for the foregoing purposes, then for the general purposes of the Medical School."	
	<hr/> \$135,000.00

GIFTS FOR IMMEDIATE USE

"A Friend".....	\$1,980.00
Salaries:	
Anonymous.....	\$1,000.00
Anonymous.....	500.00
	<hr/> 1,500.00
Appropriation by State of Massachusetts for support of Free Diagnosis Service.....	2,500.00
Current Expenses:	
George R. Agassiz.....	250.00
Rodolphe L. Agassiz.....	25.00
Mrs. Leonard D. Ahl.....	50.00
Edward B. Alford.....	25.00
Miss Martha A. Alford.....	100.00
John S. Ames.....	50.00
Anonymous.....	500.00
Anonymous.....	50.00
Anonymous.....	500.00
Edward W. Atkinson.....	100.00
Charles F. Ayer.....	50.00
Miss Ellen S. Bacon.....	50.00
Hugh Bancroft.....	25.00
Mrs. John W. Bartol.....	25.00
Mrs. Walter C. Baylies.....	500.00
Mrs. Junius Beebe.....	10.00
Frank B. Bemis.....	100.00
	<hr/>
Carried forward	\$2,410.00

<i>Brought forward</i>	\$2,410.00
William Sturgis Bigelow.....	300.00
Mrs. Charles Bigwood.....	15.00
Charles S. Bird.....	25.00
George Nixon Black.....	100.00
Mrs. Arthur W. Blake.....	20.00
Mrs. Francis Blake.....	50.00
William Blodgett.....	25.00
Daniel M. Bonney and Mrs. Bonney.....	100.00
Mrs. Frederick T. Bradbury.....	2,500.00
Henry G. Bradlee.....	50.00
Mrs. Edward D. Brandegee.....	100.00
Mellen Bray Estate, Trustees of.....	100.00
Miss Sarah F. Bremer.....	50.00
Miss Fannie R. Brewer.....	25.00
Miss Florence N. Bridgeman.....	100.00
Mrs. Shepard Brooks.....	50.00
Mrs. John A. Burnham.....	10.00
Allston Burr and Mrs. Burr.....	25.00
I. Tucker Burr.....	50.00
Mrs. Arthur Tracy Cabot.....	200.00
Godfrey L. Cabot.....	1,100.00
Henry B. Cabot.....	20.00
Miss Georgina S. Cary.....	25.00
Miss Louise W. Case.....	50.00
Miss Marian R. Case.....	25.00
Mrs. Theodore Chase.....	25.00
Mrs. Costello C. Converse.....	500.00
Mrs. T. Jefferson Coolidge.....	1,000.00
Mrs. Charles E. Cotting.....	100.00
Miss Elizabeth A. Cotton.....	200.00
Mrs. David R. Craig.....	100.00
Mrs. George G. Crocker.....	100.00
Mrs. Stephen V. R. Crosby.....	500.00
John S. Curtis.....	50.00
Philip Y. DeNormandie.....	25.00
Carl Dreyfus.....	25.00
Mrs. Frank E. Dunbar.....	100.00
Miss Hannah M. Edwards.....	50.00
Nathaniel H. Emmons.....	100.00
Mrs. Robert W. Emmons, 2d.....	100.00
William Endicott.....	100.00
John W. Farlow.....	25.00
Miss Fannie M. Faulkner.....	25.00
Sewell H. Fessenden.....	50.00
Frederick P. Fish.....	25.00
Mrs. Richard T. Fisher.....	100.00
Mrs. W. Scott Fitz.....	25.00
Thomas A. Forsyth.....	25.00
Mrs. Louis A. Frothingham.....	250.00
Mrs. Alvan T. Fuller.....	25.00
Homer Gage.....	50.00
Mrs. Reginald Gray.....	25.00
Edwin Farnham Greene.....	25.00
Edward W. Grew.....	25.00
Mrs. Magnus S. Haas, in memory of Abraham N. Loeb.....	100.00
Frank W. Hallowell.....	25.00
<i>Carried forward</i>	\$11,400.00

<i>Brought forward</i>	\$11,400.00
N. Penrose Hallowell and Mrs. Hallowell	25.00
Miss Ellen R. Hathaway	100.00
Augustus Hemenway	50.00
Robert F. Herrick and Mrs. Herrick	200.00
Mrs. John F. Hill	25.00
Franklin W. Hobbs	25.00
The Misses Holt	50.00
William Hooper	50.00
Mrs. Amos L. Hopkins	100.00
Henry Hornblower	100.00
Ralph Hornblower	10.00
Clement S. Houghton	50.00
Miss Elizabeth G. Houghton	25.00
Henry S. Howe	100.00
Mrs. Charles W. Hubbard	50.00
The Humane Society of the Commonwealth of Massachusetts	1,000.00
Henry S. Hunnewell	500.00
Mrs. Henry E. Huntington	5,000.00
Mrs. Oscar Iasigi	50.00
Charles C. Jackson	200.00
Henry Jackson	20.00
James Jackson	25.00
Ellerton James	20.00
Edward C. Johnson	20.00
Mrs. Benjamin M. Jones	30.00
Nathaniel T. Kidder	100.00
Mrs. Henry P. King	200.00
The Misses King	25.00
Louis E. Kirstein	50.00
Horatio A. Lamb	25.00
Thomas W. Lamont	250.00
Mrs. Gardiner M. Lane	1,000.00
Mrs. Amory A. Lawrence	50.00
Lawrence Model Lodging Houses	400.00
George C. Lee	100.00
Joseph Lee	1,000.00
Mrs. Augustus P. Loring	25.00
Mrs. Thornton K. Lothrop	125.00
Miss Mabel Lyman	100.00
James W. Maguire	25.00
Edward Mallinckrodt, Jr.	500.00
Mrs. George S. Mandell	25.00
Mrs. Charles E. Mason	1,200.00
Miss Fanny P. Mason	100.00
Miss Ida M. Mason	50.00
Mrs. Daniel Merriman	25.00
George W. Mitton	100.00
J. Pierpont Morgan	100.00
Miss Frances R. Morse	25.00
Mrs. Otis Norcross	100.00
William H. O'Connell	20.00
John B. Paine	50.00
Robert Treat Paine	25.00
Mrs. Robert Treat Paine, 2d	25.00
William A. Paine	500.00
Miss Eleanor S. Parker	100.00
<i>Carried forward</i>	\$25,645.00

<i>Brought forward</i>	\$25,645.00
George A. Peabody	500.00
James J. Phelan and Mrs. Phelan	50.00
Dudley L. Pickman	50.00
Miss Emily Dutton Proctor	2,000.00
Redfield Proctor	1,000.00
Felix Rackemann and Mrs. Rackemann	300.00
Mrs. Francis M. Rackemann, in memory of her father and mother, Mr. and Mrs. William D. Mandell	100.00
Mrs. Neal Rantoul	100.00
Philip M. Reynolds	600.00
William K. Richardson	25.00
William L. Richardson	100.00
Russell Robb	50.00
Miss Emma Rodman	25.00
Mrs. Robert S. Russell	100.00
John L. Saltonstall	100.00
Mrs. Richard M. Saltonstall	100.00
Robert Saltonstall	100.00
Sabin P. Sanger	50.00
Mrs. Francis W. Sargent	125.00
Henry B. Sawyer and Mrs. Sawyer	25.00
Miss Eleonora R. Sears	15.00
Herbert M. Sears	100.00
Mrs. J. Montgomery Sears	100.00
Mrs. Knyvet W. Sears	200.00
Richard D. Sears	100.00
Mrs. Quincy A. Shaw	150.00
Mrs. George S. Silsbee	50.00
Miss Laura Slocum	10.00
John T. Spaulding	100.00
William S. Spaulding	100.00
Robert H. Stevenson	50.00
James A. Stillman	100.00
Philip Stockton	50.00
Galen L. Stone	500.00
Nathaniel H. Stone	100.00
Miss Mary G. Storer	25.00
Robert W. Storer	25.00
Miss Alice P. Tapley	100.00
Mrs. Ezra R. Thayer	10.00
John E. Thayer	100.00
Mrs. Nathaniel Thayer	100.00
Mrs. Washington B. Thomas	25.00
Elihu Thomson	25.00
"The Eugene Tompkins Memorial"	1,000.00
Charles H. Traiser	25.00
Mrs. Alexander F. Wadsworth	15.00
Eliot Wadsworth and Mrs. Wadsworth	100.00
Charles C. Walker	100.00
Mrs. William B. Walker	100.00
Guy Waring and Mrs. Waring	10.00
Mrs. Bayard Warren	100.00
J. Collins Warren	100.00
Lucius H. Warren	50.00
Frank G. Webster and Mrs. Webster	200.00
Warren B. P. Weeks	25.00
<i>Carried forward</i>	\$35,105.00

<i>Brought forward</i>	\$35,105.00	
Mrs. Charles G. Weld.....	100.00	
Mrs. C. Minot Weld.....	50.00	
Miss Mary Weld.....	100.00	
Welfare Fund, through George F. Larcom, Trustee.....	100.00	
William P. Wharton.....	100.00	
Miss Gertrude R. White.....	25.00	
Edward F. Whitney.....	200.00	
Edward Wigglesworth.....	25.00	
George Wigglesworth..	100.00	
Hugh Williams.....	50.00	
Robert Winsor.....	50.00	
Mrs. William M. Wood.....	25.00	
Henry D. Woods.....	200.00	
	<hr/>	\$36,230.00
Grant from the Medical School for work in the laboratory of the Cancer Commission of the Flattery Research Fund.....		\$438.79

I also submit the report of Cooley & Marvin Company, certified accountants, on the finances of the Cancer Commission of Harvard University and of the Collis P. Huntington Memorial Hospital for the year ending June 30, 1923. It should be noted that this year, for the first time, these accounts have been kept on an accrued basis.

July 1, 1923.

(Signed) CHARLES JACKSON,
Treasurer

THE CANCER COMMISSION OF
HARVARD UNIVERSITY

August 29, 1923.

ROBERT B. GREENOUGH, M.D., *Director*,
The Cancer Commission of Harvard University,
695 Huntington Avenue,
Boston, Mass.

DEAR SIR: In compliance with your directions, we have supervised the accounting for all funds received and disbursed by the Treasurer of the Commission for the year ended June 30, 1923. In addition to the information appearing on the books of account kept at the hospital, we have also included in the appended exhibits figures submitted to us by the Auditor of Harvard University concerning the funds of the Commission.

Your attention is invited to the following exhibits for detailed information relative to the financial condition of the Commission at June 30, 1923, and the operating results for the year ended at that date:

Exhibit A — Statement of Funds for the year ended June 30, 1923.

Exhibit B — Combined Statement of Assets and Liabilities, as at June 30, 1922 and 1923.

Exhibit C — Statement of Receipts and Disbursements for the year ended June 30, 1923.

In the following paragraphs we comment in detail upon the Exhibits mentioned above.

Exhibit A:

This exhibit was compiled from figures furnished us by the Auditor of Harvard University. The net increase in funds for the year is \$129,950.10 and is accounted for as follows:

New Funds:

Endowment Fund — additional.....	\$20,000.00	
Charles S. Fairchild.....	5,000.00	
Elizabeth Worcester Mills.....	100,000.00	
Henry O. Underwood.....	10,000.00	
	<hr/>	
Total New Funds.....		\$135,000.00
Income Added to Emily J. Proctor Gift.....		156.50
		<hr/>
		\$135,156.50

Less:

Reduction of David Pingree Fund.....	\$1,000.00	
Deficit.....	4,206.40	5,206.40
	<hr/>	<hr/>
		\$129,950.10

Exhibit B:

This exhibit sets forth in comparative form the combined assets, liabilities and net available funds of the Commission for the current and the preceding year.

There has been an increase of \$123,405.81 in the net available funds as is shown in detail on Exhibit C.

Exhibit C:

We present on this exhibit the combined receipts and disbursements taken from both the books kept at the hospital and the Auditor's statements.

The total receipts from the usual sources were \$249,612.89 of which \$135,000 comprises new funds. These receipts are increased by \$6,832.30 through accrual by the Auditor of certain income and expenses, and by including the net assets on the hospital books in his statement of income. This practice has not been followed heretofore, but we understand that the accounts of the Commission will now be kept exclusively by the Bursar of Harvard University and this procedure was necessary to effect the transition and place the accounting system on an accrual basis. Thus total receipts from all sources are in the amount of \$256,445.19, while the total of disbursements is \$133,039.38, the excess of receipts being \$123,405.81.

GENERAL COMMENTS

Food Costs:

From statements of patient and employee days furnished by the administrative department of the hospital, we present the following statement of average daily cost of food:

	1922-23	1921-22	Increase or Decrease
In-Patient Days.....	6,115	5,466	649
Employee Days — estimated.....	12,776	13,269	493*
Out-Patient Days — estimated.....	100	153	53*
Total Days.....	18,991	18,888	103
Provisions.....	\$9,111.99	\$8,227.88	\$884.11
Kitchen and Dining Room.....	3,344.73	3,155.94	188.79
	\$12,456.72	\$11,383.82	\$1,072.90
Less: Board of Special Nurses.....	361.00	309.00	52.00
	\$12,095.72	\$11,074.82	\$1,020.90
Average Cost per Day	\$0.637	\$0.586	\$0.051

*Decrease

Hospital Revenue and Expense:

The comparative operating expenses of the hospital, excluding corporation salaries, new equipment, research expenses and sundry miscellaneous expenses, are shown as follows:

	1922-23	1921-22	Increase or Decrease
Administrative.....	\$13,732.55	\$13,559.84	\$172.71
General House and Property.....	6,272.40	5,491.89	780.51
Housekeeping.....	11,021.98	10,363.46	658.52
Laundry.....	2,509.87	2,381.43	128.44
Kitchen and Dining Room.....	3,344.73	3,155.94	188.79
Provisions.....	9,111.99	8,227.88	884.11
Care of Patients.....	17,194.04	17,643.91	449.87*
Photograph and X-Ray.....	119.66	391.35	271.69*
Warren Laboratory.....	9,024.87	4,234.90	4,789.97
*Decrease	\$72,332.09	\$65,450.60	\$6,881.49

These expenses were incurred in connection with 6,115 in-patient days and 7,151 out-patient treatments.† A comparative table showing the results of operations for this year

† Eleven months.

and last year, as regards the cost per patient day, is shown below. The out-patient treatments have been converted into patient days on the basis of five treatments being the equivalent of one patient day.

	1922-23	1921-22	Increase or Decrease
In-Patient Days.....	6,115	5,466	649
Out-Patient Days.....	1,430	1,466	36*
Total Patient Days.....	7,545	6,932	613
Operating Costs.....	\$72,332.09	\$65,450.60	\$6,881.49
Average Cost per Patient Day.....	9.59	9.44	0.15

*Decrease

The following table presents the operating income applicable toward defraying the operating expenses:

	1922-23	1921-22	Increase or Decrease
Board and Care:			
Ward Patients.....	\$9,665.94	\$8,039.42	\$1,626.52
Private Room Patients.....	5,871.00	5,270.00	601.00
Out-Patient Fees and Dressings..	5,665.75	5,096.75	569.00
Special Nursing.....	656.00	695.00	39.00*
Board of Special Nurses.....	361.00	309.00	52.00
Total.....	\$22,219.69	\$19,410.17	\$2,809.52
Radium Treatments.....	\$20,513.25	\$22,657.45	\$2,144.20*
X-Ray Treatments.....	1,442.00		1,442.00
Operations.....	3,115.00	3,143.00	28.00*
Total.....	\$25,070.25	\$25,800.45	\$730.20*
Grand Total.....	\$47,289.94	\$45,210.62	\$2,079.32
Average Income per Patient Day...	\$6.26	\$6.52	\$0.26*

*Decrease

The current year shows an increase of \$0.15 in the expenses per patient day, as compared with the preceding year, and a decrease of \$0.28 in the income per patient day, making an increase of \$0.41 in the net cost per patient day.

	1922-23	1921-22	Increase or Decrease
Average Income per Patient Day.....	\$6.26	\$6.52	\$0.26*
Average Expenses per Patient Day...	9.59	9.44	0.15
Operating Deficit per Patient Day....	\$3.33*	\$2.92*	\$0.41

*Decrease

With an increase of approximately 12 per cent in the in-patient days, the income from ward and private room patients increased approximately 16 per cent, while a decrease of three per cent in the out-patient days was reflected by an increase of 11 per cent in the income from fees and dressings.

An unusually large charge was made during the year under review for bad debts, \$7,594.06, and over-charge allowances, \$4,039.97.* During the current year \$11,634.03 was charged as compared with a charge of \$2,245.40 made in the preceding fiscal year.

A trial balance of the patients' accounts receivable was taken by us and the individual accounts were tabulated as to age. After consultation it was deemed advisable to create a reserve for all accounts outstanding over one year, and \$7,594.06 was consequently added to the reserve for bad debts to provide for these accounts.

During our examination of the accounts receivable, our attention was attracted by the great number of accounts having \$1 and \$2 balances. The collection of such small balances is costly and often uncertain, and we believe much labor could be saved and the income of the hospital materially increased if special efforts were made to collect such small amounts at the time the service is rendered.

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 (\$626.87) was on hand or on deposit at June 30, 1923.
2. That we have accounted for all cash shown to have been received at the hospital, and that we have seen satisfactory evidence of payment for all disbursements, excepting those represented by outstanding checks.
3. That the accompanying Exhibits A, B and C are in

* In previous year most of this item had been charged as a current expense, thus decreasing the size of current income.

accordance with the books of the hospital and the statements furnished by the Auditor of Harvard University.

Very truly yours,

COOLEY & MARVIN Co.

EXHIBIT A

THE CANCER COMMISSION OF HARVARD UNIVERSITY

Statement of Funds for the Year ended June 30, 1923

	June 30, 1922			For year ended June 30, 1923		Increase or Decrease in Funds	June 30, 1923			1923-1924 Income Estimated at 5.30 %
	Principal	Income	Total Funds	Receipts	Disbursements		Principal	Income	Total Funds	
Francis Bartlett Free Bed Fund.....	\$5,000.00	.....	\$5,000.00	\$270.00*	\$ 270.00	.....	\$5,000.00	.....	\$5,000.00	\$265.00
Memorial Cancer Hospital: Endowment Fund.....	101,954.64	.....	101,954.64	{ 20,000.00†	9,711.97	\$15,793.60	117,748.24	.....	117,748.24	6,240.66
				{ 5,505.57*						
T. Jefferson Coolidge Fund for Cancer Research.....	2,000.00	.....	2,000.00	108.00*	108.00	.....	2,000.00	.....	2,000.00	106.00
Caroline Brewer Croft Fund.....	92,025.00	.....	92,025.00	4,969.35*	4,969.35	.....	92,025.00	.....	92,025.00	4,877.33
William Endicott Fund.....	25,000.00	.....	25,000.00	1,350.00*	1,350.00	.....	25,000.00	.....	25,000.00	1,325.00
L. C. Fenno Fund, Treatment by Light Rays.....	20,000.00	.....	20,000.00	1,080.00*	1,080.00	.....	20,000.00	.....	20,000.00	1,060.00
Lawrence Carteret Fenno Free Bed Fund.....	5,000.00	.....	5,000.00	270.00*	270.00	.....	5,000.00	.....	5,000.00	265.00
Franklin H. Hooper Free Bed Fund.....	5,000.00	.....	5,000.00	270.00*	270.00	.....	5,000.00	.....	5,000.00	265.00
Amos Lawrence Hopkins Free Bed Fund.....	5,000.00	.....	5,000.00	270.00*	270.00	.....	5,000.00	.....	5,000.00	265.00
Marion D. Lockwood Memorial Fund.....	50,728.58	.....	50,728.58	2,739.37*	2,739.37	.....	50,728.58	.....	50,728.58	2,688.61
Julia M. Moseley Fund.....	23,250.00	.....	23,250.00	875.00*	875.00	.....	23,250.00	.....	23,250.00	1,232.25
George von L. Meyer Bequest.....	2,500.00	.....	2,500.00	135.00*	135.00	.....	2,500.00	.....	2,500.00	132.50
Clara Endicott Payson Free Bed Fund.....	5,000.00	.....	5,000.00	270.00*	270.00	.....	5,000.00	.....	5,000.00	265.00
Emily J. Proctor Gift.....	2,500.51	\$397.11	2,897.62	156.50*	.....	156.50	2,500.51	\$553.61	3,054.12	161.87
Gifts for Research in Genetics.....	320.00	.....	320.00	.....	.....	.....	320.00	.....	320.00	16.95
F. D. Moulton Gift for Social Service Worker.....	400.21	.....	400.21	.....	.....	.....	400.21	.....	400.21	21.21
James Ewing Mears Bequest.....	9,295.01	.....	9,295.01	501.93*	501.93	.....	9,295.01	.....	9,295.01	492.64
Collis P. Huntington Memorial Hospital, New Endowment.....	500.00	.....	500.00	27.00*	27.00	.....	500.00	.....	500.00	26.50
Joseph R. De Lamar Fund: New Laboratory.....	.....	.....	.....	438.79†	438.79	.....	.....	.....	.....	.....
Flattery Research Fund.....	.....	.....	.....	472.42*	472.42	.....	.....	.....	.....	.....
Dudley B. Fay Memorial.....	2,000.00	.....	2,000.00	108.00*	108.00	.....	2,000.00	.....	2,000.00	106.00
David Pingree.....	2,000.00	.....	2,000.00	.....	1,000.00	#1,000.00	.....	.....	.....	.....
Charles S. Fairchild.....	.....	.....	.....	221.02*	221.02	.....	.....	.....	.....	.....
Elizabeth Worcester Mills.....	.....	.....	.....	3,189.56*	3,189.56	.....	.....	.....	.....	.....
Henry O. Underwood.....	.....	.....	.....	461.38*	461.38	.....	.....	.....	.....	.....
Gifts for Current Expenses.....	.....	.....	.....	35,180.00†	35,180.00	.....	.....	.....	.....	.....
Gifts for Salaries.....	.....	.....	.....	1,500.00†	1,500.00	.....	.....	.....	.....	.....
Gifts for Services of Technician.....	.....	.....	.....	1,980.00†	1,980.00	.....	.....	.....	.....	.....
Gifts for Medical Laboratory.....	.....	.....	.....	1,050.00†	1,050.00	.....	.....	.....	.....	.....
Commonwealth of Massachusetts.....	.....	.....	.....	2,500.00||	2,500.00	.....	.....	.....	.....	.....
New Funds acquired during year.....	.....	.....	.....	115,000.00†	.....	115,000.00	.....	.....	.....	.....
	\$359,473.95	\$397.11	\$359,871.06	\$200,898.89	\$70,948.79	\$129,950.10	\$489,267.55	\$553.61	\$489,821.16	\$25,907.53

* Income \$23,250.10 † New Funds \$135,000.00 ‡ Gifts \$39,710.00 § Grant from Medical School \$438.79 || State Income \$2,500.00

EXHIBIT B
THE CANCER
COMMISSION OF HARVARD UNIVERSITY
COMBINED STATEMENT OF ASSETS
AND LIABILITIES

As at June 30, 1922 and 1923

ASSETS			
	<i>June 30, 1922</i>	<i>June 30, 1923</i>	<i>Increase or Decrease</i>
Cash in Office.....	\$75.00	\$75.00	
Cash in Bank.....	5,457.81	551.87	\$4,905.94*
Accounts Receivable.....	13,433.23	16,852.61	3,419.38
Inventories.....		1,564.15	1,564.15
Funds — Exhibit A.....	359,871.06	489,821.16	129,950.10
Total Assets.....	<u>\$378,837.10</u>	<u>\$508,864.79</u>	<u>\$130,027.69</u>
LIABILITIES			
Vouchers Payable.....	\$3,749.28	\$2,777.10	\$972.18*
Reserve for Bad Debts.....	220.00	7,814.06	7,594.06
Net Available Funds.....	374,867.82	498,273.63	123,405.81†
Total Liabilities.....	<u>\$378,837.10</u>	<u>\$508,864.79</u>	<u>\$130,027.69</u>

*Decrease

†See Exhibit C

EXHIBIT

THE CANCER COMMISSION
Statement of Receipts and Disbursements

DISBURSEMENTS

Operating Expenses:	
Administration.....	\$13,732.55
Care of Patients.....	17,194.04
Chemical Laboratory.....	130.28
General House and Property.....	6,272.40
Housekeeping.....	11,021.98
Hospital Laboratory.....	543.25
Kitchen and Dining Room.....	3,344.73
Laundry.....	2,509.87
Medical Laboratory.....	2,748.83
Physical Laboratory "A".....	3,917.94
Physical Laboratory "B".....	10,019.89
Provisions.....	9,111.99
State Diagnosis.....	796.72
Warren Laboratory.....	9,024.87
X-Ray Photography.....	119.66
Miscellaneous:	
Traveling Expenses.....	\$252.17
Christmas Expense.....	207.87
Publications.....	1,285.47
Sundries.....	477.32
	<u>2,222.83</u>
Total Operating Expenses.....	\$92,711.83
Other Expenses:	
Bad Debts and Allowances.....	11,634.03
Corporation Expenses:	
Salaries.....	24,012.50
New Equipment:	
General House and Property.....	\$1,256.27
Hospital Laboratory.....	53.25
Warren Laboratory.....	1,801.01
Physical Laboratory "B".....	131.70
	<u>3,242.23</u>
Paid on New Laboratory.....	1,438.79
Total Disbursements.....	\$133,039.38
Excess of Receipts — Exhibit B.....	123,405.81
	<u>\$256,445.19</u>

C

OF HARVARD UNIVERSITY

For the Year ended June 30, 1923.

RECEIPTS

Hospital Revenue:

Board and Care:

Ward Patients.....	\$9,665.94
Private Room Patients.....	5,871.00
Out-Patients — Fees and Dressings.....	5,665.75
Radium Treatments.....	20,513.25
Operations.....	3,115.00
Care of Patients Etherized.....	20.00
Special Nursing.....	656.00
Board of Special Nurses.....	361.00
Donations.....	13.00
X-Ray Treatments.....	1,442.00
Sale of Supplies.....	112.66
Consultations.....	100.00
Interest on Bank Balance.....	155.03
Miscellaneous Income.....	23.37

Total Hospital Revenue..... \$47,714.00

Other Income:

For Current Expenses:

Annual Subscriptions.....	\$40,710.00*
Commonwealth of Massachusetts.....	2,500.00
Grant from Medical School.....	438.79
Interest on Capital Funds.....	23,250.10
New Funds.....	135,000.00

Total Other Income..... 201,898.89

Total Receipts..... \$249,612.89

Net Accruals of Hospital Assets and

Liabilities made by Bursar..... 6,832.30

\$256,445.19

* Includes \$1,000 withdrawn from David Pingree \$3,000 subscription of 1921. Remaining balance of \$1,000 for year 1923-1924.

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.
October 23, 1900.
2. On the Etiology of Cancer — E. H. Nichols.
Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 34-58.
October 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.
October 23, 1900.
4. Tumors and Sporozoa of Fishes — E. E. Tyzzer.
Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 63-68.
October 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.
October 23, 1900.
6. Report of Culture Experiments made with Carcinomatous Tissue, 1889-
1900 — Oscar Richardson.
Boston Society of Medical Sciences, Journal, Vol. 5, No. 2, pp. 72-80.
October 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 Roentgen 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. 155-157. 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 Reactions 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. November 23, 1911.
33. The Huntington Hospital and the Scope of Its Work — E. E. Tyzzer and Thomas Ordway.
Boston Medical & 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. November 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.
42. Radioactive Substances in the Treatment of Cancer — William Duane.
Harvard Graduates' Magazine, June, 1915. (No reprints.)
43. The Tumors of the Japanese Waltzing Mouse and of Its Hybrids — E. E. Tyzzer.
Journal of Medical Research, Vol. 32, pp. 331-360. July, 1915.
44. On the Extraction and Purification of Radium Emanation — William Duane.
Physical Review, N. S., Vol. 5, pp. 311-326. April, 1915.
45. Cancer Research. Problems and Methods of Investigation — E. E. Tyzzer.
St. Paul Medical Journal, Vol. 17, pp. 481-487. July, 1915.
46. A Direct Reading Potentiometer for Measuring and Recording both the Actual and the Total Reaction of Solutions — W. T. Bovie.
Journal of Medical Research, Vol. 33, pp. 295-322. November, 1915.
47. Further Experimental Studies on the Inheritance of Susceptibility to a Transplantable Tumor, Carcinoma (J. w. A.) of the Japanese Waltzing Mouse — C. C. Little and E. E. Tyzzer.
Journal of Medical Research, Vol. 33, pp. 393-453. January, 1916.
48. On X-ray Wave-Lengths — William Duane and Franklin L. Hunt.
Physical Review, August, 1915.
49. Tumor Immunity — E. E. Tyzzer.
Journal of Cancer Research, Vol. 1, No. 2, April, 1916, pp. 125-155.
50. Planck's Radiation Formula deduced from Hypotheses suggested by X-ray Phenomena — William Duane.
Physical Review, N. S., Vol. 7, No. 1, p. 143. January, 1916.
51. An Active Modification of Hydrogen Produced by Alpha Rays — William Duane and Gerald Wendt.
Abstract in Physical Review, N. S., Vol. 7, No. 6, June, 1916.
52. The Action of Light on Protoplasm — W. T. Bovie.
American Journal of Tropical Diseases and Preventive Medicine, Vol. 2, No. 8, February, 1915, pp. 506-517.
53. The Biological Effects of Radium Rays — W. T. Bovie.
Journal of Cancer Research, Vol. 1, No. 3, p. 396.

54. Studies on the Inheritance of Susceptibility to a Transplantable Sarcoma (J. w. B.) of the Japanese Waltzing Mouse — E. E. Tyzzer and C. C. Little.
Journal of Cancer Research, Vol. 1, No. 3, p. 387.
55. A Rapid Method for Determining Calcium in Blood and Milk — Henry Lyman.
Journal of Biological Chemistry, Vol. 29, No. 2, p. 169. March, 1917.
56. A Reactive Modification of Hydrogen Produced by Alpha Radiation — William Duane and Gerald L. Wendt.
Physical Review, August, 1917.
57. Value of the Constant h Determined by Means of X-rays — F. C. Blake and William Duane.
Physical Review, December, 1917.
58. High-Frequency Absorption Spectra of the Chemical Element — F. C. Blake and William Duane.
Physical Review, December, 1917.
59. Radium in the Treatment of Cancer — William Duane.
Proceedings of the Second Pan-American Scientific Congress, Vol. 10, p. 503.
60. Report of Results of Radium Treatment at the Collis P. Huntington Memorial Hospital, by the Cancer Commission of Harvard University — William Duane and Robert B. Greenough.
Boston Medical and Surgical Journal, September 13, 1917, Vol. 177, No. 11, pp. 359-365.
61. Methods of Preparing and Using Radioactive Substances in the Treatment of Malignant Disease, and of Estimating Suitable Dosages — William Duane.
Boston Medical and Surgical Journal, December 6, 1917, Vol. 177, No. 23, pp. 787-799.
62. Hodgkin's Disease: A Report on the Cases Observed at the Collis P. Huntington Memorial Hospital, from April, 1913, to July, 1916, with Special Reference to Treatment with Radium and X-ray — Channing C. Simmons and George Benet.
Boston Medical and Surgical Journal, December 13, 1917, Vol. 177, No. 24, pp. 819-834.
63. Report on the Treatment of Myelogenous Leukemia with Radium — Francis W. Peabody.
Boston Medical and Surgical Journal, December 20, 1917. Vol. 177, No. 25, pp. 873, 874.
64. Report of Treatment of Carcinoma of Cervix at the Huntington Hospital for Period of Four Years — Edward H. Risley and George A. Leland, Jr.
Boston Medical and Surgical Journal, December 27, 1917, Vol. 177, No. 26, pp. 891-894.
65. Sterilization of Surgeons' Knives and Scissors by Heating in Liquid Petrolatum — Henry Lyman.
The Journal of the American Medical Association, June 23, 1917, Vol. 68, 1907, 1908.
66. Radium in the Treatment of Carcinoma of the Buccal Cavity — Robert B. Greenough.
Boston Medical and Surgical Journal, May 2, 1918, Vol. 178, pp. 598-602.
67. Delay in the Surgical Treatment of Cancer — Channing C. Simmons.
Boston Medical and Surgical Journal, November 21, 1918, Vol. 179, pp. 639-641.
68. Abstract — The Relation Between the K X-ray Series and the Atomic Numbers of the Chemical Element — William Duane and Kang-Fu Hu.
69. Abstract — The Critical Absorption and Characteristic Emission X-ray Frequencies — William Duane and Kang-Fu Hu.
Physical Review, June, 1918.

70. Abstract — The Relation Between the General X-radiation and the Atomic Number of the Target — William Duane.
Physical Review, June, 1918.
71. Sensitization to Heat Due to Exposure to Light of Short Wave-Lengths — W. T. Bovie and Alice Klein.
Journal of General Physiology, Vol. 1, No. 3, pp. 331-336. January, 1919.
72. Rate of Recovery from Action of Fluorite Rays — W. T. Bovie and D. M. Hughes.
Journal of General Physiology, Vol. 1, No. 3, pp. 323-329. January, 1919.
73. The Physiological Action of Radiation — W. T. Bovie.
Journal of Medical Research, Vol. 39, pp. 271-277. November, 1918.
74. The Approximation of the Values of the Absorption Index of Fluorite Rays in Protoplasm — W. T. Bovie.
Journal of Medical Research, Vol. 39, pp. 239-249. November, 1918.
75. The Location of the Physiological Effects of Radiation within the Cell — W. T. Bovie.
Journal of Medical Research, Vol. 39, pp. 251-265. November, 1918.
76. The Effects of Fluorite Ultra-Violet on the Rate of Division of Paramecium Caudatum — W. T. Bovie and D. M. Hughes.
Journal of Medical Research, Vol. 39, pp. 233-238. November, 1918.
77. The Effects of Quartz Ultra-Violet on the Rate of Division of Paramecium Caudatum — W. T. Bovie and D. M. Hughes.
Journal of Medical Research, Vol. 39, pp. 223-231. November, 1918.
78. On the Critical Absorption Frequencies of the Chemical Elements of High Atomic Numbers — William Duane and Takeo Shimizu.
Physical Review, Vol. 13, p. 159. February, 1919.
79. Are the Frequencies in the K Series of X-rays the Highest Frequencies as Characteristic of a Chemical Element — William Duane and Takeo Shimizu.
Physical Review, Vol. 13, p. 289. April, 1919.
80. On the Relation between the K Series and L Series of X-rays — William Duane and Takeo Shimizu. (Abstract of No. 82.)
Physical Review, Vol. 13, p. 306. April, 1919.
81. Chordoma — E. M. Daland, M.D.
Boston Medical and Surgical Journal, Vol. 180, p. 591. May, 1919.
82. On the X-ray Absorption Wave-Lengths of Lead Isotopes — William Duane and Takeo Shimizu.
Proceedings of the National Academy of Sciences, Vol. 5, p. 198. June, 1919.
83. On the Relation between the K Series and L Series of X-rays — William Duane and Takeo Shimizu.
Physical Review, Vol. 14, p. 67. July, 1919.
84. What We Know about Cancer — R. B. Greenough, M.D., James Ewing, M.D., and J. M. Wainwright, M.D.
Bulletin No. 14, American Society for the Control of Cancer, July, 1919.
85. On the Critical Absorption and Characteristic Emission X-ray Frequencies — William Duane and Kang-Fu Hu.
Physical Review, Vol. 14, p. 369. November, 1919.
86. On the Spectrum of X-rays from an Aluminum Target — William Duane and Takeo Shimizu.
Physical Review, Vol. 14, p. 389. November, 1919.
87. On the Relation Between the Intensity of the General X-radiation and the Atomic Number of the Anticathode — William Duane and Takeo Shimizu.
Physical Review, Vol. 14, p. 525. December, 1919.
88. On the X-ray Absorption Frequencies Characteristic of the Chemical Elements — William Duane and Kang-Fu Hu.
Physical Review, Vol. 14, p. 516. December, 1919.

89. On the X-ray Absorption Frequencies Characteristic of the Chemical Elements — William Duane and Takeo Shimizu.
Physical Review, Vol. 14, p. 522. December, 1919.
90. The Treatment of Tumors by X-ray and Radium — Robert B. Greenough.
Boston Medical and Surgical Journal, June 16, 1921, Vol. 184, pp. 622-627.
91. Cancer: Factors Entering into the Delay in Its Surgical Treatment — Channing C. Simmons and Ernest M. Daland.
Boston Medical and Surgical Journal, September 2, 1920, Vol. 183, pp. 298-303.
92. On the K Series of X-rays — William Duane and Wilhelm Stenström.
Proceedings of the National Academy of Sciences, August, 1920, Vol. 6, pp. 477-486.
93. Characteristic Absorption of X-rays: L Series — William Duane and R. A. Patterson.
Proceedings of the National Academy of Science, September, 1920, Vol. 6, pp. 509-518.
94. On the Relative Positions and Intensities of Lines in X-ray Spectra — William Duane and R. A. Patterson.
Proceedings of the National Academy of Science, September, 1920, Vol. 6, pp. 518-527.
95. The Combined Operative and Radium Treatment of Malignant Disease of the Nasal Accessory Sinuses — Harry A. Barnes.
Boston Medical and Surgical Journal, December 2, 1920, Vol. 183, pp. 648-656.
96. Concerning the Nature of "Protozoan-Like" Cells in Certain Lesions of Infancy — Ernest W. Goodpasture and Fritz B. Talbot.
American Journal of Diseases of Children, May, 1921, Vol. 21, pp. 415-425.
97. The A B C of Radium — Ernest M. Daland.
Boston Medical and Surgical Journal, June 30, 1921, Vol. 184, pp. 696-702.
98. The Etiology of Acute Inflammations of the Nose, Pharynx, and Tonsils — Stuart Mudd, Samuel B. Grant, and Alfred Goldman.
Annals of Otology, Rhinology and Laryngology, March, 1921, Vol. 30, pp. 1-73.
99. Reactions of the Nasal Cavity and Postnasal Space to Chilling of the Body Surface. 1. Vasomotor Reactions — Stuart Mudd, Alfred Goldman and Samuel B. Grant.
The Journal of Experimental Medicine, 1921, Vol. 34, p. 11.
100. Reactions of the Nasal Cavity and Postnasal Space to Chilling of the Body Surface. 2. Concurrent Study of Bacteriology of Nose and Throat — Alfred Goldman, Stuart Mudd and Samuel B. Grant.
The Journal of Infectious Diseases, 1921, Vol. 29, p. 151.
101. On the X-ray Spectra of Tungsten — William Duane and R. A. Patterson.
Physical Review, 1920, Vol. 16, p. 526.
102. Data Relating to X-ray Spectra. With a Brief Statement of Their Bearing on Theories of the Structure of Atoms and the Mechanism of Radiation — William Duane.
Bulletin of the National Research Council, 1920, Vol. 1, p. 383.
103. Bone Sarcoma. An Analysis of the Cases Admitted to the Massachusetts General and the Collis P. Huntington Memorial Hospitals, from January 1, 1911, to January 1, 1921 — Robert B. Greenough, Channing C. Simmons and Torr W. Harmer.
Journal of Orthopaedic Surgery, 1921, Vol. 3, p. 602.
104. Radium in Cancer of the Bladder — George Gilbert Smith.
Surgery, Gynecology and Obstetrics, 1921, Vol. 33, p. 570.
105. The Basal Metabolism in Myelogenous Leukemia and Its Relation to the Blood Findings — Arthur H. Gunderson.

- Boston Medical and Surgical Journal, 1921, Vol. 185, p. 785.
106. Radical Treatment of Cancer of the Bladder — George Gilbert Smith.
The Journal of Urology, 1921, Vol. 6, p. 173.
 107. Megacaryocytes in the Peripheral Circulation — George Richards Minot.
Journal of Experimental Medicine, 1922, Vol. 35, p. 1.
 108. X-ray Spectra Produced Under Various Experimental Conditions —
William Duane.
Journal of Radiology, 1922, Vol. 3, p. 69.
 109. Roentgen Rays of Short Wave-Lengths and Their Measurement —
William Duane.
American Journal of Roentgenology, 1922, Vol. 9, p. 167.
 110. Treatment of Cancer of the Bladder by Radium Implantation — George
Gilbert Smith.
Journal of Urology, 1923, Vol. 9, p. 217.
 111. Management of Cancer of the Bladder — George Gilbert Smith.
Boston Medical and Surgical Journal, 1922, Vol. 187, p. 97.
 112. Carcinoma of the Antrum. Treatment by Radium. Statistics and
Technique — D. Crosby Greene.
American Journal of Roentgenology, 1922, Vol. 9, p. 591.
 113. Radium Treatment of Keloids — Ernest M. Daland.
Surgery, Gynecology and Obstetrics, 1923, Vol. 36, p. 63.
 114. The Results of Operations for Cancer of the Lip at the Massachusetts
General Hospital from 1909 to 1919 — Channing C. Simmons and
Ernest M. Daland.
Surgery, Gynecology and Obstetrics, 1922, Vol. 35, p. 766.
 115. The Electrical Response of the Eye and Optic Nerve under Stimulation
by Light — E. L. Chaffee, W. T. Bovie, and Alice Hampson.
Journal of the Optical Society of America and Review of Scientific
Instruments, 1923, Vol. 7, p. 1.
 116. New Experiments on the Sensitization of Protoplasm to Heat by Exposure
to Light of Short Wave-Length — W. T. Bovie and G. A. Daland.
American Journal of Physiology, 1923, Vol. 66, p. 55.
 117. Further Experiments on the Sensitization to Heat Due to Exposure of
Short Wave-Lengths — H. S. Forbes and G. A. Daland.
American Journal of Physiology, 1923, Vol. 66, p. 50.
 118. A New Vessel for Electrometric Titration — W. T. Bovie.
Journal of the American Chemical Society, 1922, Vol. 44, p. 2892.
 119. Note Regarding Potential Differences between Cells and the Fluids
Bathing Them with a Suggestion as to Terminology — Stuart Mudd.
(Not published.)
 120. Factors Affecting Filtration through Berkefeld Candles. 1. Motility
and Size as Influencing Relative Filterability of *V. Percolans* and *V.*
Cholerae Asiaticae — Stuart Mudd.
Journal of Bacteriology, 1923, Vol. 8, p. 459.
 121. A Readily Cultivable *Vibrio*, Filterable through Berkefeld V. Candles,
Vibrio Percolans (New Species) — Stuart Mudd and Shields Warren.
Journal of Bacteriology, 1923, Vol. 8, p. 447.
 122. Notes on the Potential Difference between Glass and Electrolytes in
Contact with the Glass — Walter Hughes.
Journal of the American Chemical Society, 1922, Vol. 44, p. 2860.
 123. The Scientific Basis of Short Wave-Length Therapy — William Duane.
American Journal of Roentgenology, 1922, Vol. 9, p. 781.
 124. Rouleaux Formation of Red Cells in Various Types of Disease — David
Brewster Swift.
Journal of Laboratory and Clinical Medicine, 1922, Vol. 7, No. 10.
 125. Measurement of Dosage by Means of Ionization Chambers — William
Duane.
The American Journal of Roentgenology, 1923, Vol. 10, p. 399.
 126. Cancer of the Prostate — George Gilbert Smith.
Boston Medical and Surgical Journal, 1923, Vol. 188, p. 621.

