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ANNUAL REPORT  
OF THE  
GOVERNORS, PRINCIPAL AND FELLOWS  
OF  
MCGILL UNIVERSITY, MONTREAL,  
FOR THE YEAR 1889.

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*(Published by permission of His Excellency the Governor-General, Visitor of the University.)*

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*To His Excellency the Right Honourable Baron Stanley of Preston., G.C.B., P.C., Governor-General of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:—

We beg leave respectfully to present to Your Excellency, as Visitor of this University, under its Royal Charter, the following Report of the history and statistics of the University and its Faculties and Affiliated Institutions, in the educational year, ending December 31st, 1889.

The past year, while in the main uneventful, has been marked by a steady growth in the efficiency of the University and its Colleges, and in the magnitude of its work; and was auspiciously inaugurated by the visit of Your Excellency and Lady Stanley in February, an honour which will long be remembered by us, and we hope will be the precursor of other visits, more

especially on occasion of our annual meetings of Convocation for the conferring of degrees.

The office of Chancellor of the University, vacant by the death of the Honble. Senator Ferrier, in May 1888, has remained for some time unfilled, the senior resident member of the Board of Governors, Mr. J. H. R. Molson, having kindly consented temporarily to discharge its duties. The office has now been filled by the unanimous election of the Honble. Sir Donald A. Smith, LL.D., K.C.M.G., whose public inauguration took place on October 31st, in the presence of the Convocation and students, and of a large gathering of the friends of the University. On that occasion we were also favoured with the presence of Mr. Peter Redpath, the founder of the Museum which bears his name, who has for some years rarely been able to be present at our University meetings.

We have to record with regret the serious loss sustained by the University in the past year in the removal by death of the honoured and beloved Dean of the Faculty of Medicine, Dr. Robert Palmer Howard, LL.D. Dr. Howard had been one of the professors of the Medical Faculty since 1854, and in his later years occupied the important positions of Dean of the Faculty and Professor of the Theory and Practice of Medicine. His kind and conciliatory manner, his sterling qualities of mind and heart, his able and conscientious discharge of all his duties, and his earnest and self-sacrificing interest in the welfare of the University, of his Faculty and of its students, had endeared him to all; and his death while still in the vigour of his powers was most deeply felt, and cast a dark shadow over the close of the past session of the Faculty of Medicine.

The office of Dean was filled at as early a date as possible by the appointment of Dr. Robert Craik, who was recalled from the well-merited rest of an emeritus professorship; and in view of the large increase of work now devolving on the Dean, Dr. George Ross, M.A., was appointed Vice-dean and was transferred to the chair of medicine. These appointments will fully sustain the efficiency of this Faculty.

An important benefaction of a general University character is that of a sum of \$40,000 to form the John Frothingham Principal Fund, given by Mrs. J. H. R. Molson and her brother,

Rev. Frederick Frothingham, and named in commemoration of their father. This fund places the succession to the principalship in a secure position, and in the mean time has enabled the Board of Governors to relieve the Principal of a considerable part of his professorial work by the appointment of Mr. Frank D. Adams, M.A. Sc., as lecturer in Lithology and Geology.

The total number of students attending lectures in McGill College in the present Session is 690. Details will be given in the notices of the several Faculties. In addition to this there are 38 students in Affiliated Colleges in Arts, and 74 Teachers-in-training in the Normal School, of whom however 4 are enrolled in the college classes. It should be noted in connection with the number stated above, that not less than 550 in McGill College and 38 in Affiliated Colleges are undergraduates, actually attending lectures in the full courses of study for University degrees, and that of these, more than 400 are from places beyond the limits of Montreal.

At the Meetings of Convocation in March and April seventy six degrees were conferred, viz. :—

In Law.....	3
In Medicine.....	38
In Arts.....	25
In Applied Science.....	10
	76

The Honorary degree of LL.D. was conferred on George Stewart, D.C.L., F.R.S.C., in acknowledgment of his services to Canadian Literature and History.

Eight gold medals and one silver medal were awarded to successful candidates in the graduating classes of the different Faculties, including the medals kindly presented by Your Excellency in the Faculties of Arts and Applied Science.

In the classes of the Normal School, 95 Diplomas were granted by the Superintendent of Education ; namely 15 for Academies, 36 for Model Schools, and 44 for Elementary Schools.

In the June examinations for the title of Associate in Arts, 82 candidates passed in the examinations for Associate and

three for Junior certificates. These candidates came up from eighteen schools, and a large number fulfilled the requirements for matriculation in Arts or in Applied Science.

An important addition has been made to the number of our Faculties, by the introduction of the long-celebrated and most efficient Veterinary College of Montreal into the University as its Faculty of Comparative Medicine and Veterinary Science.

For the first time in the history of the University, Music has been introduced as a definite study, under Mr. William Bohrer, well known in Montreal as an instructor in musical art and science. Classes have been formed for men and for women, in connection with the University Musical Association and that of the Donalda Special Course. The expenses incident to this new departure have been defrayed in the case of the men by the liberality of Prof. James C. Cameron, M.D., and in the case of the women by the generous aid of the Chancellor. The classes in music are open to the students of all the Faculties.

The Provincial Association of Protestant teachers, having decided to hold its Annual Convention in Montreal in October last, was entertained in the Peter Redpath Museum by the Chancellor and the Principal, and the occasion was honoured by the presence of a large number of leading friends of education from the city and elsewhere.

The wants of the University referred to in former Reports with reference to college lodgings, dining hall and rooms for societies have not yet been supplied, and there is urgent need of division of some of the more important chairs in view of the great increase in the number of students. It is also to be observed that notwithstanding the large endowments received for special purposes, the general funds of the University, available for any educational object and for unforeseen emergencies, are still very deficient.

#### FACULTY OF LAW.

The number of students in Law is still small, in consequence of the operation of the causes referred to in our last Report. The number in attendance is only eighteen, but an increase is expected in next session.

The Session was opened with a public lecture by the Dean of the Faculty, which was well attended and elicited expressions of public interest in the Faculty. Improved and more convenient class-rooms have been secured, and the Professors have exerted themselves to the utmost in the present session to render the lectures useful and efficient.

We have to express our thanks to the Council of the Bar for amending the oppressive regulations against which we felt it to be our duty, in the interest of education, to protest in our last Report.

We regret that serious illness will prevent Prof. Lareau from delivering his lectures in the second term of the Session. The Governors have however secured the services of Mr. J. Fortin, LL.L. of Laval, whose lectures, as substitute for Prof. Robidoux, were so acceptable last session.

The importance of this Faculty in the interest of professional education, and more especially in the preparation of efficient men not only for the Bar, but for the Legislature and the Judiciary, should commend it to the interest of the friends of education. An effort to secure for it an endowment has been begun by some of the graduates, and it is hoped may prove successful. One or two well-endowed Chairs are necessary to secure its permanence and to give to it the position which the value of its work demands.

#### FACULTY OF MEDICINE.

The changes in the staff of this Faculty have already been referred to. Its students have attained to the large number of 257, all of whom are regular undergraduates attending lectures and practical work; and the fact that so many resort to it from all parts of the Dominion testifies to its high efficiency and reputation.

The Faculty continues to exert itself to keep pace with all the improvements in medical education; and to that end the Professors have, as in former years, liberally presented the fees of the Summer Session, amounting to \$1253, in aid of new apparatus and appliances. A movement is also in progress for a subscription, which has been headed by the Chancellor, toward

a Howard Memorial Fund, in memory of the late lamented Dean of the Faculty.

#### FACULTY OF ARTS.

The number of students in this Faculty continues to increase, and in the present session has reached to 297. Of these, 175 are undergraduates: viz. 130 men and 45 women; 122 being partial and occasional. The increase in the number of undergraduates taking the full course of lectures and study for the degree of B.A. is a gratifying feature in this connection.

The bill introduced by the Hon. Mr. Lynch in the last session of the Legislature for the recognition of the Degree of Bachelor of Arts as a qualification for entrance on professional studies, was carried in the House of Assembly, but unfortunately defeated in the Legislative Council. It will however be renewed in the present session, and there is every reason to hope that it will now become law, and will remove what has hitherto been a blot on the educational reputation of this Province and a great discouragement to liberal education.

In this Faculty no less than 152 exemptions from sessional fees have been granted in the present session. Of these 79 are to students of Affiliated Theological Colleges in preparation for the Christian ministry, and the greater part are to young men from the country districts. Ten Scholarships, Exhibitions and Bursaries, and one Medal-Prize were awarded in the September examinations, varying in value from \$125 to \$50. The larger number are the gift of Mr. W. C. McDonald; the others from the benefactions of Mr. Hague, the late Major Mills, Mrs. Redpath, Mr. Alexander and Mrs. Molson.

We are indebted to some of our friends for a contribution of \$250 per annum for three years, in augmentation of the salary of the chair of Hebrew and Oriental languages, so ably held by Rev. Prof. Coussirat, and it is hoped that means may be found permanently to place this important chair in an improved position as to salary.

In connection with this Faculty it is to be observed that, in addition to its own regular students, certain of its classes are

attended by large numbers of students of other Faculties and Affiliated Colleges, so that the actual number of students in attendance on lectures is over four hundred. This large attendance is now urgently demanding increased accommodation, and the division of some of the chairs, for which farther endowments will be needed.

The Donalds Special Course has now also attained to such importance and assured success that it becomes increasingly desirable that the wishes of its liberal founder should be realised in its extension into a College, so situated as to take advantage of all its present facilities in connection with the University, and yet with more complete appliances than at present and a staff of its own, in addition to that of the Faculty of Arts. In connection with this department a demand has also arisen for instruction in physiology and hygiene, which the Faculty is at present unable to supply, but which, if means could be provided, would be important in the interest of men as well as of women.

The Students in the Donalds Special Course have, as hitherto, distinguished themselves in the examinations: and with the arrangements made for their separate instruction and the careful supervision exercised by Miss Gairdner, as Lady Superintendent, there seems no reason to believe that any injury to health has resulted or is likely to result from their taking the full work of the regular course of study. It is proper to make this statement, since so much discussion has recently taken place elsewhere as to alleged injury to health arising from academical study. Such injury, however, in so far as it occurs, seems to be due rather to certain conditions of competition than to the actual work required of the student.

With regard to the health of the students, it appears that the daily walk to and from classes, though involving some fatigue and exposure, has been advantageous, a fact which makes the provision of college residences less necessary, except perhaps in the case of students from distant homes not having friends or relations in the city.

Material improvements have been made by the Faculty of Arts in its matriculation examinations, both in giving them greater breadth and definiteness, and in making them more

accessible, especially to intending students residing at a distance. The institution of June examinations in connection with those for Associate in Arts, in local centres, has tended very much to give greater facilities to candidates; while the several grades of advanced examinations provided, secure to the better prepared students and the schools which train them, proportionate standing and advantages.

#### THE FACULTY OF APPLIED SCIENCE.

The number of students in this Faculty has increased to 72, a gratifying evidence of its appreciation as a means of training for the professions for which it provides, and in the studies leading to which the students divide themselves somewhat evenly, though Civil and Mechanical Engineering still attract a larger number than Mining Engineering and Practical Chemistry.

In the present session a want previously felt has been supplied by the institution of lectures on Sanitary Engineering. In support of these, Mr. J. H. Burland has added to his former benefactions a donation of \$100.

The department of Mechanical Engineering has hitherto laboured under some disadvantages, but these will now be removed by the large bequest of the late Thomas Workman, Esq., amounting to the sum of \$117,000, to found the Thomas Workman Department of Mechanical Engineering, providing for the necessary rooms and workshops and an endowment for the professor and assistants. Feeling that it would be most desirable to economise on building and plant, so as to secure as large a sum as possible for salaries and maintenance, the Dean of the Faculty has brought the matter under the notice of a number of leading manufacturers and others, and has secured a large number of subscriptions, which while valuable in themselves, derive additional importance from the testimony which they afford to the public appreciation of the practical value of the engineering school. It is hoped that the list of these donations may be sufficiently advanced to be appended to this Report. The building for the new Department will if possible be begun next spring.

The Faculty awarded in its September examinations five exhibitions and prizes, including those from the British Association Fund, the Scott exhibition and the Burland prize for Chemistry.

FACULTY OF COMPARATIVE MEDICINE AND  
VETERINARY SCIENCE.

This new Faculty is now organised with three ordinary and four associate Professors and a Demonstrator. Its students will henceforth be recognised as University students, and at the end of their course will receive on passing the required examinations the degree of Doctor of Veterinary Science.

It is hoped that in its new relations to the University, the Montreal Veterinary College will increase rather than diminish its deserved reputation and the confidence which the public feels in the proficiency of its graduates.

The University, feeling the great importance of a thorough School of this kind, will do all in its power to secure this result.

The number of students in the Veterinary Faculty is 50. Of these, 22 are from Quebec, 7 from Ontario, 2 from Manitoba and the North West, 1 from Nova Scotia and 18 from the United States.

AFFILIATED COLLEGES.

Morrin College, Quebec, has received a much-needed aid in the liberal donation of the heirs of the late Honble. James Ross, which has enabled the College to add to its staff, by the appointments of Rev. T. Macadam as Professor of Logic and Mental and Moral Philosophy, and of Rev. A. T. Love, B.A., as Professor of English and of Political Economy.

The number of students is 23, and the College expects to send up six candidates for the degree of B.A. at the close of the session.

St. Francis College returns 15 students, and has two in preparation for the Intermediate Examination of next April. Fifteen of the students of this College are now continuing their studies in this University, 13 in McGill College and 2 in Mor-

rin. Of the 15 now in attendance, twelve are undergraduates in arts. The remaining three are preparing to enter the Faculty of Applied Science.

The four Affiliated Theological Colleges are in a prosperous condition, and working in harmony in every respect with the University.

Arrangements have been made for the affiliation of the Wesleyan College, Stanstead, as a College in Arts of the second class, preparing students for the Intermediate Examination. This affiliation will it is hoped be an educational benefit to an important section of this Province and will add a useful and creditable College to the University.

#### THE MCGILL NORMAL SCHOOL.

This invaluable institution, the centre of educational training for the teachers of the Protestant people of this Province, has maintained, and still farther improved its work during the session. Its number of students was 86 at the beginning of the Session, besides 329 pupils in the Model Schools. The Diplomas, 95 in number, granted at the close of last session, raise the total number given to students of the school since its commencement to 2104, granted to 1489 persons.

The retirement of Mr. Andrew on his well-merited pension, deprives the school of one who has for many years taken a leading place in instructing the students in reading and pronunciation, and whose labours have borne good fruit. Mr. Neil Warner takes the place of Mr. Andrews. Miss Green has been promoted to the Professorship of Drawing and Mr. Smiley to the office of Head Master of the Boys' Model School. Both are teachers of approved efficiency and success.

Considerable additions have been made within the year to the library, apparatus and furniture of the School; and the work-shop for the boys erected last year has been in successful operation. The addition to the Primary School building for which urgent application was made last year, and for which there is now still greater need, has not yet been provided for by the Government; but it is hoped will be attended

to in the estimates for the present year. Many repairs and improvements are also needed in the main building.

#### THE LIBRARY.

The Library Committee reports a considerable addition of books by purchase and donation. In this connection, it should be stated that the McGill College Book Club has as usual been a considerable contributor. A reference to the utility of this society and its claims to support on the part of Members of the University will be found in the appended Report of the Hon. Librarian. The total number of books now amounts to 28,637 volumes, of which 835 have been added during the past year.

The large increase of books, and the greater number of readers due to the augmentation of the classes, are now urgently demanding increased accommodation. The Committee has taken all the measures in its power to provide for these wants in the existing rooms, but it will soon be necessary seriously to consider the means of enlargement.

#### THE PETER REDPATH MUSEUM.

The work of the Museum and the classes held therein proceed as heretofore. The collections have been increased by many important donations, some of which are noticed in the Report of the Committee.

The donations of Mr. Peter Redpath and Mrs. J. H. R. Molson for maintenance and salary of the Curator have been continued.

Many improvements have been made in the arrangement and labelling of specimens.

The removal of the Botanical Laboratory from the Herbarium room to the centre building, has set the former free for the better accommodation of the collections of plants.

Mr. Charles Gibb, M. A., now travelling in the East, has kindly undertaken to collect for the Museum, Mr. J. H. R. Molson contributing to meet the expense. Mr. Gibb has already forwarded some fine crustaceans and fishes from Japan.

### THE GYMNASIUM.

This is still carried on efficiently by Mr. Naismith, with classes for ladies under Miss Barnjum. The number of male students entered is 120, and the average attendance at the hours of instruction has been 75. The class of women is only 16 in number, owing to the distance of the building and the difficulty of arranging suitable hours.

The Board of Governors has offered the present gymnasium and the lot on which it stands for sale, and on its being disposed of, it is proposed to erect an improved building on the College grounds, if possible in immediate connection with the campus. This it is hoped will secure, not only improved facilities, but much larger classes, as the present building is at an inconvenient distance.

Could means be obtained, it might be possible to connect with a new gymnasium, rooms for certain college societies and a college dining-hall; and it may also be expedient to consider whether the gymnasium itself might not be so constructed as to be available for the larger public meetings of the University.

### THE OBSERVATORY.

The Report of the Superintendent, Prof. McLeod, shows that the meteorological observations and time-service have been regularly continued, and gives details as to the methods and results. In connection with the time service, measures have been taken with reference to improvement of this service in the Government buildings at Ottawa, and to extending its benefits in the city of Montreal.

Ten students have availed themselves of the instructions in transit observations. Three students have received instructions in magnetic observing, and one has taken the certificate for meteorological observations.

Observations on sunspots have been regularly maintained and the results are stated in the special Report.

## BOTANIC GARDEN.

In the past summer, a portion of the grounds has been enclosed with a wire fence, and partially prepared for beds, and a pond for aquatic plants has been prepared, under the direction of Prof. Penhallow. The work will be proceeded with next spring, when it is also proposed to solicit contributions for the conservatory to be erected in the garden. The ground enclosed includes that portion in which for several years a collection of trees, shrubs and native plants has been in progress under the care of the Principal. Among these are a number of valuable foreign trees and shrubs presented by Mr. Charles Gibb.

Prof. Penhallow's Report on the botanical work now in progress is appended, and may be held to show very clearly the necessity for a botanical garden and conservatory on the grounds.

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The statement of the Revenue and Expenditure of the University for the financial year ending June 30th is appended.

In conclusion, while grateful for the prosperity which has been vouchsafed to us in the past year, and for the liberal gifts of the friends of education, we shall not cease to direct public attention to the many important educational objects in connection with the University which remain to be provided for, and shall hope that ere long some of the more urgent of these needs will be supplied.

On behalf of the Corporation,

We have the honour to be,

Your Excellency's Humble Servants,

DONALD A. SMITH, LL.D.,  
*Chancellor.*

(Signed),

J. WM. DAWSON, LL.D.,  
*Principal.*

MONTREAL, January 22nd, 1890.

## LIBRARY COMMITTEE REPORT FOR 1889.

*To the Corporation of McGill University.*

GENTLEMEN :—

In presenting their Seventh Annual Report, the Committee have much satisfaction in reporting continued improvement in the condition of the library, and an unprecedented increase both in the numbers of those using it, and in the number of books used.

The appointment of Mr. Mott as Library-Assistant has been continued by the Board of Governors for the present session, and he has discharged his duties to the satisfaction of your Committee.

In the last Annual Report, reference was made to the necessity that then existed for increased shelf-room for the proper keeping and classification of the books, which are, from time to time, added to the Library. The difficulty arising from this, as well as that of finding proper accommodation for students and other readers, has grown, and is becoming more embarrassing every session, with the increase of students and readers, and it necessitates the occupation of the alcoves for reading purposes. Closely connected with this matter, is the importance and desirability of providing a more secure place for the greater safe-keeping of many rare and valuable books, which have been acquired by the Robson, Griffin, Ramsay and other donations.

In the month of April, application was made to the Board of Governors for a grant of \$250.00 for purposes of binding; which application the Governors acceded to, and the grant was spent in binding 197 volumes. But this barely enabled the Committee to bind the periodicals that were added to the Library on account of the year, whilst hundreds of valuable books were still left in need of binding.

In view of these matters, the Committee deemed it expedient to bring under the notice of the Board of Governors :—(1) The growing difficulty of finding adequate accommodation for students and other readers; (2) The want of increased shelf-room for the proper safe-keeping of the books; (3) The number of books still remaining unbound; and (4) To ask an additional grant to help to meet these difficulties.

In reply, the Governors made a further grant of \$250.00, of which \$200.00 were to be spent on binding, and \$50.00 on providing more shelf-room. These matters have received the careful attention of the Committee.

The sum of \$431.31 from the Ramsay bequest has been expended during the year, which leaves a balance of \$206.69 at the credit of the account. The Committee have exercised their best judgment and care in the selection of books in accordance with the terms of the bequest for purchase, and they have been enabled to add many valuable works, bearing on the history of British North America, to the Library.

Among the donations of the year, which have been reported and acknowledged every quarter, is to be specially noted a superb edition of the works of Dante, in four volumes, by the late Lord Vernon, presented to the Library by the Dowager Lady Vernon; a work of unique beauty, and worthy of the great Italian poet.

The McGill College Book Club, to which the Library has been so largely indebted for the past twenty years, has sent a further donation of 259 volumes in various departments of literature. In this connection, the Committee deem it proper in their Annual Report to call the attention of members of the Corporation, and of the University generally, to the valuable and important service this Society has already rendered, and is still endeavouring to render, to the University, by the donation, from time to time, of books which are its property.

The old catalogue of the Library, which was prepared more than ten years ago, needs to be largely augmented, in order to its setting forth the contents of the Library; and, not only so, but a classification according to *subjects*, in addition to that of authors' names, is much needed. But this is a large undertaking, and one that would require a considerable expenditure both of time and of money for its successful accomplishment. It has been suggested that a beginning might be made, by cataloguing the books relating especially to the History of Canada and the American Colonies, which would be a good foundation for the fuller and more complete catalogue.

The general statistics of the year have been:—Readers, 7,100; visitors, 243; books read, 3,375; books lent, 3,188; books bound, 194; total volumes in Library, 28,637; increase for the year 1889, 835.

There are a considerable number of books in paper covers which are not included in the grand total.

All which is respectfully submitted by your Committee.

GEORGE CORNISH, LL.D.,  
*Honorary Librarian.*

MCGILL COLLEGE,  
January 21st, 1890.

## CONSPECTUS OF LIBRARY FOR 1889.

QUARTERS ENDING.	READERS.	VISITORS.	BOOKS READ.	BOOKS LENT.
April 22, 1889.....	2980	51	1314	1091
June 18, 1889.....	444	32	229	588
October 23, 1889.....	1008	125	808	674
January 20, 1890.....	2668	35	1024	835
	7100	243	3375	3188

## PETER REDPATH MUSEUM.

## REPORT OF THE COMMITTEE.

The Museum Committee had the honor to report to the Corporation, at its October meeting, the renewal of the furnaces for heating the building, under a vote of the Board of Governors; the continuance by Mr. Peter Redpath and Mrs. J. H. R. Molson of their liberal grants for the maintenance and the salary of the Curator, also that the removal of the classes in practical Botany to more commodious rooms in the centre building had set free the space occupied by these classes in the Plant-room for the accommodation of the additions to our collections in Botany.

The gifts to the Museum during the year have been numerous, and include a valuable collection of Canadian mammals, eighteen species in all, from Sir Donald Smith, who has also presented the unmounted skeleton and skin of a musk ox; a collection of aboriginal implements, &c., from the New Hebrides, presented by the Rev. Hugh Robertson, missionary in the Island of Erromanga; a collection of crustacea and fishes from Japan, procured by the kind agency of Mr. Charles Gibb for the Museum, out of the donation of Mr. J. H. R. Molson, and which includes a perfect example of the gigantic crab, *Macrocheira kæmpferi*: also a collection of fossil corals and pleistocene plants, collected by Mr. J. Townsend, and presented by Sir William Dawson. Valuable models for class illustration have also been procured, and a number of species have been added by gift, purchase and exchange. In the latter direction several collections of fossils have been made up and despatched to institutions abroad.

We hope in the present year to have much done in the better arrangement of the duplicate specimens in the drawers of the Museum, and to add new cases for botanical specimens in the Plant-room.

The work of class instruction has gone on as usual in the Museum in the Ordinary and Honour Classes in Geology, Zoology and Botany. In connection with these classes, and with special studies of advanced students and graduates, the stores of duplicate specimens and of alcoholic specimens, &c., are in constant use.

Prof. Penhallow reports as follows, on the condition of the Herbarium, and the improvements effected and contemplated :

" During the past year work has been continued in the herbarium, the arrangement of which is now nearly completed. The Holmes Herbarium, which formerly occupied several cases, and which was in a somewhat dilapidated condition, has been merged with the general collection, whereby its scientific value has been considerably enhanced. The plants collected by Dr. Holmes were, in many instances, obtained from localities of interest, many of which have wholly disappeared in the growth of the city of Montreal. All the specimens required remounting and poisoning, and in order to preserve the distinctive character of the collection as far as possible, special labels, bearing Dr. Holmes' name, were provided for them.

" During the past summer there have been added a collection of Canadian plants from the Geological Survey, through Prof. Macoun ; a valuable collection of Florida plants, collected by Mr. A. H. Curtiss, and purchased out of the J. H. R. Molson fund for specimens ; and also a collection of marine algæ and maritime plants, from the New England coast, collected by myself. In all, about eight hundred new species have been added since the date of the last Annual Report, thus making the total number of specimens now in the collection about 10,476, representing 7,162 species.

" The complete removal of the classes in practical botany from this room, now admits of using the entire space for the extension of the herbarium and economic collection, to which purpose it will be wholly devoted for the future."

Prof. Penhallow has also presented a report on the Botanical Laboratory, and the preparations in progress for a Botanic garden. These objects are of so much educational importance that the report is annexed, as constituting the beginning of a new department in connection with the University.

Mr. W. R. Deeks, B.A., an honour graduate of last year, has been employed under the Principal in determining, arranging and cataloguing Silurian and other fossils during the Session.

The Committee also report that Mr. Currie continues his work, and in addition to mounting specimens, has collected a number of

fossils in the course of the summer, and that Edward Ardley, the caretaker, has done much useful work, especially in mounting specimens and slicing rocks and fossils.

The number of visitors registered in the past year was 2,100, being 500 in excess of the previous year.

All which is respectfully submitted.

(Signed) B. J. HARRINGTON, B.A., Ph. D.  
*Honorary Curator.*

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REPORT BY PROF. PENHALLOW ON BOTANICAL LABORATORY AND GARDEN.

*Laboratory.*

In 1886 an advanced course in botany in the third and fourth years, embracing practical histology, was established, and temporary quarters for the class were provided in the Herbarium room of the Peter Redpath Museum. The growth of the Herbarium, as well as the constant and increasing demand for the instruction provided in this course, soon resulted in this room being wholly inadequate to the requirements of the work. With the removal of the Faculty of Applied Science to their new quarters in the east wing, the old drawing-rooms became available, and were granted by the Governors. With a northern aspect and abundance of light, these were readily converted into a laboratory, to which purpose they were in many ways suited. There has thus been provided, with a minimum of expense, a laboratory well adapted to and well equipped for a thorough course in vegetable histology. It embraces a private laboratory and office, a store-room and a general laboratory. The latter is supplied with vegetation oven, sterilising oven, microtomes and such other apparatus as is required by such a course. This is, we believe, the first laboratory of the kind opened in Canada, and it is intended to give students advantages equal to those to be obtained at the best American Universities.

The course of instruction now adopted is on the inductive method. Each student, at the outset, is instructed on the construction and use of the microscope, the defects peculiar to such instruments, and the means adapted to eliminate them. In the second stage, the various histological elements, commencing with protoplasm and the albuminoids, and ending with the miscellaneous products of plant life, are dealt with. Each is studied fully as to its appearance and micro-chemical behavior. The third stage involves a study

of tissues, after which the student enters upon the fourth and last stage, the complete histology and life history of plants. By this means, the student is led from the more simple to the more complex, by successive steps, in such a way that each one depends upon, and is, to a large extent, a review of all the preceding. Drawing, especially in the second year of the course, is made a prominent feature, and each student is expected to make one complete set of drawings of at least one plant in each group studied.

*Botanic Garden.*

The efforts which have been made for some time past to secure a suitable botanic garden to meet the requirements of University work, now seem likely to be realized in the immediate future. A portion of the College grounds, embracing somewhat more than three acres, has been assigned for this purpose. A careful survey has been made by the engineering students, under direction of Prof. McLeod, and a detailed plan is in course of preparation.

During the last summer a pond for aquatic plants was constructed, and considerable work was also done in laying out the walks and beds preparatory to planting next spring, after which date the regular work of a botanic garden will be continued.

The basis of a garden was established some years since by Sir William Dawson, who, for many years has been gathering important representatives of arborescent and herbaceous vegetation from various parts of the world. These are at present growing in the grounds to be used as the garden. In addition to this, valuable material from various sources, has been accumulating during the last three years, until at the present time a very large number of plants are on hand, and will at once be made available for the purposes of the garden. The bulk of this material has been received from the Royal Gardens at Kew, from the Imperial Botanic Gardens at St. Petersburg, and from our former benefactor, Mr. Charles Gibb. We have also received an important contribution of seeds for planting, from Prof. C. S. Sargent, of the Arnold Arboretum, Harvard University.

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REPORT ON THE MCGILL COLLEGE OBSERVATORY  
MONTREAL, FOR THE YEAR ENDING  
DECEMBER 31st 1889.

*To the Corporation of McGill University.*

GENTLEMEN:

I have the honour to present the report on this Observatory for the year now closed, being my sixteenth annual report:—

*Meteorological Observations*:—The usual meteorological observations, as particularized in my report for 1888, have been carried forward without interruption, throughout the year. The daily results, as also the monthly and yearly summaries, have been published in the Montreal Gazette. The monthly and yearly summaries have also, since the beginning of this year, by arrangement with the Natural History Society, been published in the Canadian Record of Science.

*Time Service*:—Determinations of clock errors have been made by the observations of 729 star transits on 139 nights; and by one solar observation. The character of these observations and the methods employed have been briefly specified in former reports. The noon time-ball for the use of shipping has been regularly dropped on week days, during the season of navigation. Time signals have also been transmitted, continuously throughout the year. Exchanges of clock signals with Toronto Observatory were made on fifteen nights. The corrected average of the differences between the mean time clocks of the two observatories is 0.26 and the greatest difference on any one night was 0.63. The comparisons for the year show that the probable error of the time given by one observatory as compared with that given by the other is 0.22. The exchanges on twelve nights were found to be favourable to the measurement of "wave time" and give a mean result for the year of  $0.015 \pm 0.002$ . This result combined with the two previous years gives a mean result  $0.019 \pm 0.001$ , as the wave time over 335 miles of No. 10 iron wire under the conditions of an ordinary telegraph line.

In accordance with the instructions of the Minister of Marine, I examined the condition of the time service to the Parliament Buildings, Ottawa, and reported thereon under date Jan. 12th last, making recommendations with a view to its improvement. The Minister was pleased to approve of the proposed changes, and acting under his instruction I visited Ottawa on the 9th of September to direct the work. The tower-clock was found to have met with injury in its striking portion since my previous examination. This damage was repaired, the clock taken down, thoroughly cleaned and remounted. Owing to difficulty in obtaining the necessary telegraphic connections between the clock-tower and the time gun, I found it impossible to completely carry out my instructions at that time. It is hoped that this difficulty will shortly be removed, permitting a much needed reform in the Government time service to be effected.

*Sunspots*:—All the spots visible on the sun, during the year, were observed by projection on a screen attached to the "Blackman"

telescope. The heliographic latitude and longitude of each spot at the time of observation, and also the areas of the spots, have been determined with approximate accuracy. A summary of the results of these observations is presented herewith. Several photographs of the sun's disc were obtained by the photoheliograph, during the months of July and August, when there was the greatest amount of solar disturbance.

*Soil temperatures*:—The apparatus described in my report for last year, for the observation of the temperature of the soil at various depths, has been in use throughout the year, and has been improved in its action by substitution of a mercurial switchboard, of my own design, for the ordinary metal-contact switch previously employed. The observations of the past year will shortly be reduced and the results published in the "Record of Science."

*Educational*:—Instruction in transit observations was given to ten students and in the use of magnetic field instruments to three taking the advanced course in surveying. The usual course of instruction in meteorology was given and a certificate granted to one student. The "Blackman" telescope has been at the disposal of the Professor of Astronomy, in the Faculty of Arts, for the illustration of his lectures.

*General*:—The usual attention has been given to inquiries by the public on scientific subjects connected with the work of the Observatory.

Respectfully submitted,

C. H. McLEOD,  
*Superintendent of the Observatory.*

MCGILL COLLEGE,  
January 16th 1890.

## SUNSPOTS FOR THE YEAR 1889, OBSERVED BY PROJECTION ON "THOMSONS DISCS."

Date of commencement of period.	No. of days on which observations were made.	Total number of new spots observed.	No. of new groups.	Average distance from the equator.	Average number of spots per day.	New spots north of the equator.		New spots south of the equator.	
						No.	Average heliographic latitude.	No.	Average heliographic latitude.
January 1 to January 11.2 .....	1	0	0	—	0	0	—	0	—
January 11.2 .....	11	14	4	4.3	2.2	14	4.3	0	—
February 7.5 .....	16	10	2	11.1	2.1	0	—	10	11.1
March 6.8 .....	11	15	5	4.3	2.5	5	3.5	10	5.5
April 3.1 .....	18	7	3	3.4	0.8	3	3.5	4	3.0
May 0.4 .....	11	10	1	4.7	1.4	0	—	10	4.7
May 27.5 .....	12	20	2	4.0	5.7	0	—	20	4.0
June 23.8 .....	15	19	3	7.2	4.8	0	—	19	7.4
July 21.0 .....	19	67	8	12.8	10.0	14	3.5	53	13.6
August 17.2 .....	23	2	1	18.9	0.6	0	—	2	18.9
September 13.5 .....	8	10	2	21.0	2.4	0	—	10	21.0
October 10.8 .....	18	10	2	19.6	0.6	10	19.6	0	—
November 7.1 .....	0	0	0	—	0.0	0	0.0	0	—
December 4.4 to December 31.1 .....	9	23	5	21.2	3.3	9	20.0	14	22.0
Year 1889	172	207	38	11.2	2.9	55	9.3	152	11.3

The dates given in the first column, except January 1st and December 31st, correspond with the coincidence of the assumed prime meridian of the sun, with the central meridian as defined in the "Observatory" ephemeris for 1889. The numbers in the sixth column are obtained by dividing the total number of single spot observations in a rotation, by the number of days on which observations were made during the rotation.

A large spot, which was first observed near the eastern limb on June 17th (whole area about  $10^{\frac{15}{00000}}$  and umbra  $10^{\frac{60}{00000}}$  of the sun's hemisphere) made one complete revolution and was observed on its second rotation until it disappeared beyond the western limb on July 24th. It did not greatly alter in form or area while visible. A large group, first seen on August 2nd, was observed in the two following rotations and disappeared about the end of September, having been last seen in longitude E  $12^{\circ}$  on September 28th. On their re-appearance these groups have been counted as "new." A small spot (area about 5 units) was observed in latitude S  $40^{\circ}$  on June 30th.

[The lists of donations to the Library and Museum will be contained in the Annual Calendar.]

*STATEMENT of the RECEIPTS and EXPENDITURE of the  
from 1st July, 1888,*

**RECEIPTS.**

<b>GOVERNMENT GRANTS:—</b>		
Provincial.....	\$2,500 00	
Superior Education.....	1,650 00	
Dom. Gov't Grant, Observatory, \$500; Observers, \$600.....	1,100 00	
City of Montreal, to Observatory, \$150; Harbor Com'rs, \$250.....	400 00	
	\$5,650 00	
<b>SCHOLASTIC FEES:—</b>		
Additional Botany.....	42 50	
Faculty of Arts (Ordinary, \$836.25; Library, \$664.00).....	1,500 25	
Faculty of Applied Science (Ordinary, \$2,964.90; Library, \$252.00).....	3,216 90	
Botany and Zoology.....	400 00	
Registration (Ordinary, \$422.00; Higher Degrees, \$30.00).....	452 00	
School Examinations.....	406 50	
Diploma.....	391 59	
Gymnastic.....	439 75	
	6,849 49	
COLLEGE GROUNDS MAINTENANCE.....	225 00	
MUSEUM MAINTENANCE.....	99 50	
<b>ANNUAL DONATIONS:—</b>		
Scholarships and Exhibitions.....	275 00	
Prizes.....	75 00	
	350 00	
<b>SPECIAL DONATIONS:—</b>		
Redpath Museum Maintenance.....	1,056 00	
Current Expenses.....	6,450 00	
<b>INTEREST ETC., FROM INVESTMENTS:—</b>		
Net Returns—Including arrears from former years.....	31,247 82	
ELECTION OF FELLOWS.....	188 00	
SUNDRY PETTY RECEIPTS.....	7 65	
	\$52,067 46	
<b>TOTAL ORDINARY RECEIPTS.....</b>		
<b>RECEIPTS—SPECIAL FUNDS:—</b>		
Applied Science Class Rooms.....	6,000 00	
Chair of Botany.....	900 00	
Ladies Arts Fees, \$1,239.00; Donalds Interest, \$6,111.20.....	7,350 20	
Leachoil and Campbell Fund—Interest.....	3,679 93	
Gale Chair Fund—Interest.....	1,516 90	
Molson's Museum Maintenance.....	7 59	
Philosophical Apparatus.....	1,792 59	
	\$21,247 21	
<b>INVESTMENT ACCOUNT:—</b>		
Gale Chair—On Account.....	213 75	
Campbell Memorial Fund—On Account.....	50 00	
John Frothingham—Principal Fund.....	40,000 00	
	\$40,263 75	
Investments repaid during year.....	77,775 00	
SPECIAL SAVINGS BANK BALANCES on hand 30th June, 1888.....	2,371 09	
LEACHOIL AND CAMPBELL FUNDS, BANK BALANCE 30th June, 1888.....	2,977 35	
DONALDA ENDOWMENT FUND do do.....	8,785 12	
GENERAL FUND do do.....	8,289 69	
	\$22,423 25	
	\$213,776 67	

(Verified and found correct.)

MACINTOSH &amp; HYDE, Auditors.

ROYAL INSTITUTION for the *ADVANCEMENT* of *LEARNING*,  
to 30th June, 1889.

EXPENDITURE.

ADMINISTRATION:—		
Salaries (Principal, Secretary and Clerk) .....	\$ 2,649 92	
Office Expenses .....	263 12	
Porters and Caretakers .....	1,389 42	
	<u>4,302 46</u>	\$ 4,302 46
GENERAL EXPENSES:—		
Fuel .....	1,280 25	
Printing, Advertising and Stationery .....	1,811 70	
Charges (Gibson, Mills and Baynes, Annuities; Markgraf Allowance) .....	3,534 54	
College Repairs, \$1,390.01; Grounds Maintenance, \$350.13 .....	1,740 14	
Law Charges, \$133 05; Principals Secretary, \$150 .....	283 05	
Insurance .....	44 94	
	<u>8,694 62</u>	8,694 62
EDUCATIONAL:—		
Faculty of Law .....	1,477 75	
Faculty of Arts .....	9,303 04	
Faculty of Applied Science .....	7,795 94	
Observatory Account .....	1,662 41	
Diploma Account .....	193 12	
Natural Philosophy Class, \$44.18; Chemicals, \$56.09 .....	100 27	
School Examinations .....	586 90	
Botany Classes .....	259 48	
Gymnastic Account—Instructor, Fuel, etc. ....	906 45	
	<u>32,285 36</u>	32,285 36
SCHOLARSHIPS AND EXHIBITIONS .....	2,134 50	
MEDALS AND PRIZES .....	839 31	
	<u>2,973 81</u>	2,973 81
LIBRARY ACCOUNT, \$345.66; MAINTENANCE, \$861.14; BOOKS, \$254.72; BINDING, \$98.99 .....	1,560 51	
MUSEUM MAINTENANCE .....	1,817 37	
ELECTION OF FELLOWS .....	51 30	
	<u>\$51,685 43</u>	\$51,685 43
IMPROVEMENTS AND ADDITIONS:—		
Gymnasium .....	430 34	
College Buildings .....	52 64	
Laboratory .....	39 79	
General Fixtures and Furniture .....	209 99	
Scientific Apparatus .....	333 49	
College Grounds, Pond and Fence .....	275 73	
	<u>1,341 38</u>	1,341 38
EXPENDITURE SPECIAL FUNDS:—		
Applied Science Class Rooms .....	5,988 72	
Chair of Botany .....	1,999 92	
Ladies' Arts Classes .....	6,889 71	
Leanehoil and Campbell Funds—Interest .....	3,537 90	
Gale Chair Fund—Interest .....	1,600 00	
Special Donation to Museum .....	117 25	
R. A. Ramsay Library Fund .....	423 14	
Molson's Museum Maintenance .....	540 00	
Ladies Class Room Furniture .....	3 60	
	<u>21,100 24</u>	21,100 24
INVESTMENT:—		
Invested during the year .....	70,800 00	
Expended on Properties .....	56 62	
	<u>70,856 62</u>	70,856 62
SPECIAL SAVINGS BANK BALANCES, 30th June, 1889 .....	1,073 80	
LEANCHOIL AND CAMPBELL FUNDS; BANK BALANCES, 30th June, 1889 .....	2,169 38	
DONALDA ENDOWMENT FUND, do. do. ....	9,247 01	
GENERAL FUND, do. do. ....	56,302 81	
	<u>68,793 00</u>	68,793 00
		<u>\$213,776 67</u>

Montreal, 15th July, 1889.

J. W. BRAKENRIDGE, *Acting Bursar.*