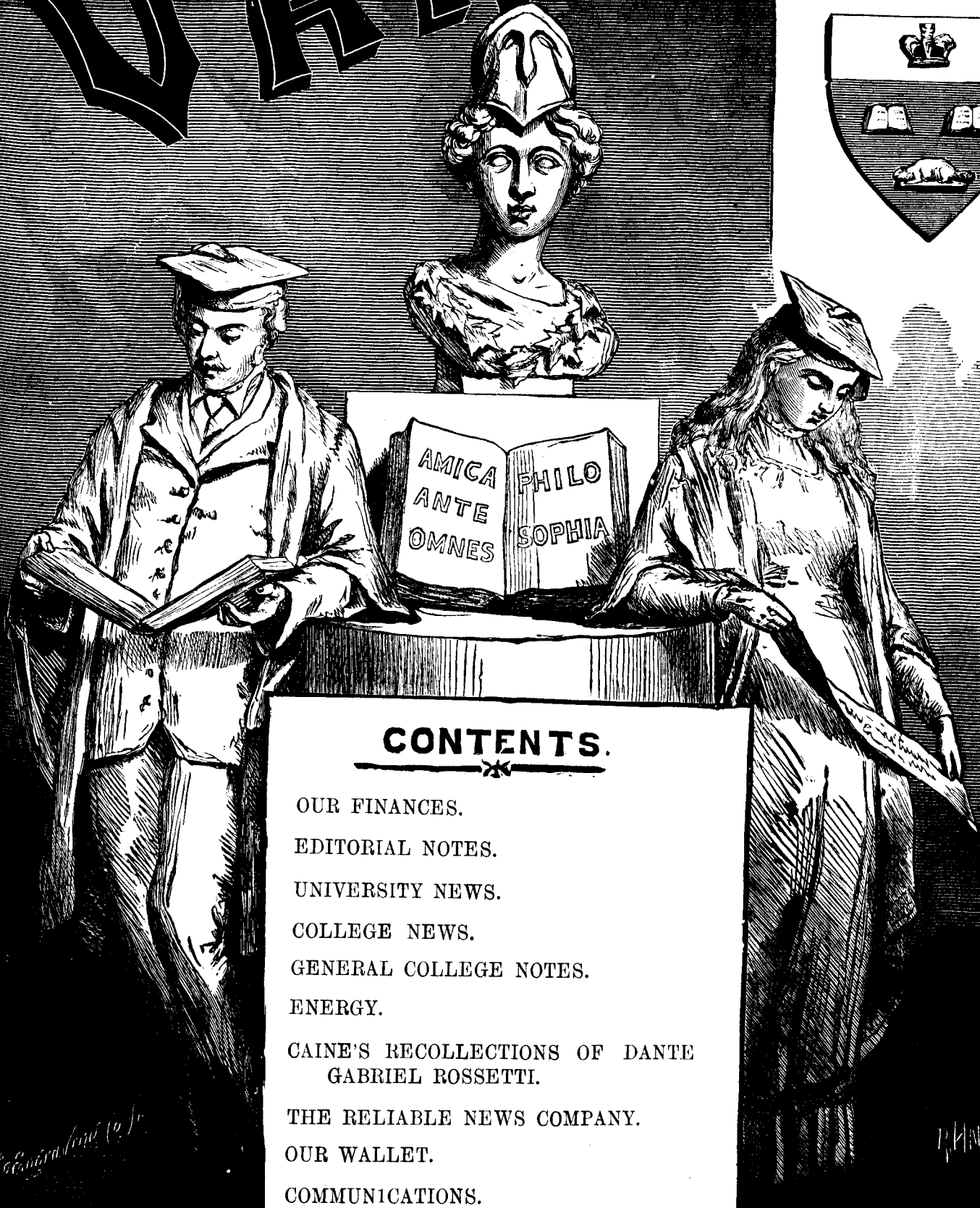


# THE WARSTICY



## CONTENTS.

- OUR FINANCES.
- EDITORIAL NOTES.
- UNIVERSITY NEWS.
- COLLEGE NEWS.
- GENERAL COLLEGE NOTES.
- ENERGY.
- CAINE'S RECOLLECTIONS OF DANTE  
GABRIEL ROSSETTI.
- THE RELIABLE NEWS COMPANY.
- OUR WALLET.
- COMMUNICATIONS.

University of Toronto, Jan. 26, 1884.

true and interesting reports of the performers. If the star is 'indisposed,' our despatches invariably say that she quarrelled with the manager, or the leading support. Should the leading support be suffering from a 'severe cold,' we always say that he is 'drunk.' Thus you see we guarantee the public absolutely correct and reliable news, and that's what the public wants, and that's what the public will willingly pay for. Of course you will understand that I have only given you a very brief and imperfect outline of our system. I am enlarging and perfecting it every day. Our Bureau of Reliable Intelligence will be divided into several departments, such as (1) Political News, (2) Telegraphic News, (and here I would remark that our 'English Letters' and 'Foreign Letters,' from 'Our Own Correspondents,' are not written in our home offices, but actually come from the places where they are dated, and are furnished by our own travelling corps of writers, (3) Musical and Dramatic Criticism, and (4) Local News, and as many others as places and circumstances suggest. It's my own opinion that our Bureau of Reliable Intelligence should be made a Government Institution, same as the Telegraph and Postal Departments. I should be glad to have you give our Company a 'boom' in Toronto, as I see by reading your papers, which are most enterprising and readable otherwise, that the public must be sadly in need of *reliable* and *trustworthy* intelligence in regard to public affairs,—especially in political doings."

Thanking Col. Trewe for the interesting account of his most unique and singular project with which he had favored me, your correspondent withdrew, after promising to 'boom' the 'Bureau of Reliable Intelligence,' and the foregoing is the 'boom' thereof.

Toronto, 15th January, 1884.

ERIC.

#### MEDALS.

Whether the advice of 'Gold Medallist' to those seeking a medal, is good or not, and whether the devious ways by which he obtained one are, or are not, those usually followed, are questions which each will answer according to the bias of his own opinions. It is to be regretted that his modest estimate of his own attainments is coupled with so poor an opinion of those of the examiners. Many things combine to make very difficult, the securing of satisfactory examiners in our University. The curriculum is being rapidly extended, men who have had the advantages of a post-graduate course, and men engaged in teaching the subjects of examination, are seldom available. The appointments are made at too short a time prior to the examinations, to give those appointed the opportunities necessary to prepare well considered papers. And even if these appointments were made earlier, the remuneration is not sufficient to warrant any extensive preparation. Notwithstanding all these things, however, the majority will probably not be inclined to think our examiners men with hobbies, susceptible to flattery, and the unconscious dupes of artful candidates. In some cases they may not know any more of the subjects of examination than those they examine, but it is no more than reasonable and just to suppose that they understand clearly the questions they ask, and their correct answers. Instead of the examiners being the sport of the examined, the reverse is likely the much more frequent occurrence. It would not be difficult to believe that some of the answers of 'Gold Medallist' have afforded rare fun to examiners.

If there is any one thing which 'Gold Medallist' shews more conclusively than another, it is the need of an enlargement of the present examination hall. It is no easy matter to tell who is, or is not morally color-blind, when a chance for crookedness in an examination presents itself. Divinity students have been seen copying in Convocation Hall, while many others who would not hesitate to do things more particularly forbidden in the decalogue, would not be guilty of cribbing at an examination. It is undoubtedly the fact that the present hall does not give that assurance of freedom from unfairness on the part of competitors which it should.

So far as the gratuitous expressions of opinion from 'Gold Medallist' are concerned, they may be taken simply as such. It may be that it does not require brains to secure a medal. The one sample he presents does not prove or disprove it. It may be that, 'it is by a rare fluke that the best man gets the prize.' An examination of successive class lists, with a view to ascertaining in which department appear the greatest changes in the order of the names, would seem to indicate that this assertion, if restricted to the department of classics, might have some foundation in fact. It would be vain to deny that sometimes medals have not been bestowed in the spirit in which they were intended, and equally vain would it be to deny that

the differences between competitors have at times been so small as to make a medal too great a distinction. However, the opinion is tenable, and probably prevails, that in the great majority of cases, the prizes go to those the most deserving of them.

It is not to be understood that any plea is here made for the medal system. Happily the strongest arguments against it are not of so personal a character as those advanced by 'Gold Medallist.' Academic honors which appear so important to the majority of students, that anything like a generous rivalry is almost entirely precluded, which interpose a barrier to that friendship and good will towards one another which should animate college classmates, should not be conferred. A system which leads to stealing of note-books and copying at examinations, which obscures the ends and aims as well as a great many of the advantages of a collegiate training by placing before the student a false criterion of success, which tends to make education less liberal and more special, may have its excellences to compensate for these defects, but they are not obvious. That health is sometimes impaired, and that minds are frequently so strongly turned in one direction as to effectually resist any attempts to change them, in this absurd race after medals, can scarcely be doubted. To this last fact rather than to any lack of brains, is probably due, the result that few who have secured academic honors attain to eminence in any other than the teaching profession.

—T. G. C.

### Communications.

To the Editor of the 'Varsity.

DEAR SIR,—Carlyle, Ruskin, and others have devoted much time to endeavors to impress upon their fellow men the importance of the truism that life is not long enough for one to read all the books that have been and are being published. It behooves those of us who wish to have a general knowledge of what is going on, in addition to a special knowledge of some particular branch to endeavor to obtain and read one or two of the best books on each subject.

In connection with this I have a suggestion to make. New books are continually being added to the University library, and reviews, English, French, and German, are periodically arriving, of many of which the majority of the undergraduates know nothing except, perhaps, the name, and many graduates have not even this advantage. Lists of new books are from time to time published, but nothing is said of the contents of the various reviews, each article of which deserves to be recorded just as much as if it were published in book form. The introduction of these into the lists would be of great advantage, especially, I may say, to science students.

But this is not enough. Let a column or so of each issue of the 'Varsity' be devoted to reviews of the new books and the articles in the latest reviews. It seems to me that such a column would be serviceable in more ways than one. It would supply not the mere name of the book, which in most instances indicates nothing, but a brief digest of the contents, whereby anyone could at once decide as to the advisability of devoting a few hours to their perusal. It would enable graduates and others residing out of Toronto to learn the nature of the additions, and thus enable them to economise any few moments they may be able to spare to a visit to the library when in the city. And lastly, but by no means least, it would enable young students to gain aptitude in reviewing, no unimportant talent in this age of criticism. Trusting that these suggestions may find favor in your eyes,

I remain,

Yours respectfully,

J. PLATFAIR McMURRICH.

Guelph, Jan. 18, 1884.

## University of Toronto.

### NOTICE.

Notice is hereby given to the Graduates, Undergraduates and friends of the University of Toronto that a BANQUET will be given in the Pavilion, Horticultural Gardens, on FRIDAY EVENING, 15th February, 1884.

As the number of tickets is limited, those who desire to obtain the same will please apply to the undersigned as soon as possible. Tickets \$2.

JOHN A. PATERSON, M.A., Secretary,  
9 and 10 Masonic Hall, Toronto Street, Toronto.  
Toronto, 21st January, 1884.

THE ANNUAL CONVERSAZIONE  
OF THE  
**Literary & Scientific Society**

Will be held on  
THURSDAY EVENING, FEB. 14th, 1884.  
Tickets may be had on application to R. J. Duff, Treasurer.

NOTICES.

Subscribers are reminded that their subscriptions are now due. They will please remit the amount \$2.00, to the Treasurer, J. F. EDGAR, as soon as possible.

The 'VARSITY is published in the University of Toronto every Saturday during the Academic Year, October to May, inclusive.

The Annual Subscription, including postage, is \$2.00, payable before the end of January, and may be forwarded to THE TREASURER, J. F. EDGAR, University College, to whom applications respecting advertisements should likewise be made.

Subscribers are requested to immediately notify the Treasurer, in writing, of any irregularity in delivery.

Copies of the 'VARSITY may be obtained every Saturday of J. S. ROBERTSON & BROS., corner of Adelaide and Toronto Streets.

All communications should be addressed to THE EDITOR, University College, Toronto, and must be in on Thursday of each Week.

Rejected communications will not be returned, to which rule no exception can be made. The name of the WRITER must always accompany a Communication.

**J. S. ROBERTSON & BROS.,**  
Booksellers and Stationers,  
TORONTO, ONT.

The Post Office Book Store. Cor. Toronto and Adelaide Sts.

Students who desire first-class Natural History Specimens should call on

**MELVILLE, THE NATURALIST,**  
319 YONGE STREET.  
BIRDS AND ANIMALS STUFFED TO ORDER. Price Lists sent on application. New and second-hand Books always on hand.

—: THE : STUDENTS' : CORNER :—

**SHAPTER & JEFFREY,**  
Dispensing Chemists, - Cor. Yonge and Carlton.  
A full assortment of TOILET REQUISITES, SPONGES, SOAPS, COMBS, HAIR, TOOTH and NAIL BRUSHES, PERFUMERY, etc.  
**A liberal discount to students.**

**University of Toronto.**

The Annual Examinations of the Faculty of Medicine (other than for Matriculation) will commence on Monday, April 14th.

The Annual Examinations in Law, Arts, Civil Engineering, Agriculture and Matriculation in Law will commence on Monday, May 5th.

The Annual Commencement for conferring Degrees, &c., will be held on Tuesday, June 10th.

Candidates for Degrees higher than that of Bachelor in any Faculty must give notice (according to a printed notice furnished on application) on or before April 14th.

The ordinary Junior Matriculation Examinations in Medicine and Arts will commence on Tuesday, June 24th.

The Senior Matriculation in Arts, Matriculation in Civil Engineering and Agriculture, and the Supplemental Examinations in all the Faculties, will commence on Monday, September 15.

Candidates for any Examination are required to give notice to the Registrar (according to a form which will be furnished on application) at least three weeks before the commencement of the Examination for which they intend to present themselves.

ALFRED BAKER, M.A., Registrar.  
University of Toronto, Jan. 16th, 1884.

**CIGARETTE SMOKERS** who are willing to pay a little more for Cigarettes than the price charged for the ordinary trade Cigarettes will find the **Richmond Straight Cut No. 1** SUPERIOR TO ALL OTHERS.

They are made from the **BRIGHTEST, MOST DELICATELY FLAVORED AND HIGHEST COST GOLD LEAF** grown in Virginia, and are absolutely WITHOUT ADULTERATION or drugs.

**Richmond Gem Curly Cut.**  
The brightest and most delicately flavored Gold Leaf grown in Virginia. This tobacco is delightfully mild and fragrant, absolutely without adulteration or drugs, and can be smoked or inhaled with entire satisfaction, without irritating the lungs, throat or mouth.

**Caution.**  
Base imitations of this brand have been put on sale, and Cigarette smokers are cautioned that this is the Old Original brand, and to observe that each package or box of **RICHMOND STRAIGHT CUT CIGARETTES** bears the signature of

**ALLEN & GINTER,**  
Manufacturers,  
Richmond, Va

ALSO MANUFACTURER OF  
RICHMOND STRAIGHT CUT, TURKISH & PERIQUE MIXTURE, OLD RIP LONG CUT, &c., &c., &c.—TOBACCOS.  
OPERA PUFFS, LITTLE BEAUTIES, RICHMOND GEM, &c.—CIGARETTES

**Special Notice to Students.**

**OUR ASSORTMENT OF GENTS' FURNISHINGS**  
IS NOW COMPLETE COMPRISING ALL THE CHEAP, MEDIUM AND BEST MAKES IN

GENT'S SHIRTS AND DRAWERS,  
FINE FLANNEL SHIRTS,  
FINE HOSIERY,  
GLOVES OF EVERY DESCRIPTION.

OUR ASSORTMENT IN

◀ Silk Scarfs, Fine Collars and Cuffs ▶  
**Has no Rival.**

A CALL SOLICITED. DISCOUNT TO STUDENTS.

**WILLIAM EAST,**  
Corner Yonge and Walton Streets.



**STUDENTS :**

For good Boots and Shoes go to

**S. R. HANNA,**  
428 & 430 YONGE STREET, TORONTO,

Where you will get Special Reductions, just south of Carlton Street.

CHOICE WINES, LIQUORS & CIGARS.

**CAER HOWELL HOTEL**

COLLEGE AVENUE, TORONTO.

HENRY ANETT LAYTON,

Proprietor.

**FINE TAILORING EMPORIUM.**

**SAMUEL CORRIGAN,**

Merchant Tailor and Importer of Select Woollens,

122 YONGE STREET, Second door North of Adelaide Street, TORONTO.  
Fit, Workmanship and Style assured. Prices very moderate. A trial Solicited.

**JOHN MACDONALD & CO.,**  
IMPORTERS,

21, 23, 25, 27 Front Street. TORONTO.  
28, 30, 32, 34 Wellington St.

—:AND:—

21 MAJOR STREET, MANCHESTER, ENGLAND.

The best place to get **LABATT'S ALE** is at

◀ **LEA'S** ▶

WHERE IS KEPT ALL KINDS OF

WINES, LIQUORS AND GENERAL GROCERIES.

382 Yonge Street, - - - TORONTO.

Corner of Gerrard Street.

ESTABLISHED 1833.

# ROWSELL & HUTCHISON,

## Importers of Books and Stationery,

—PRINTERS AND PUBLISHERS.—

Have constantly in Stock the Books required for the Universities, Public and Private Schools.

CATALOGUES SENT FREE TO ANY ADDRESS.

ROWSELL &amp; HUTCHISON, . . . . . 76 KING STREET EAST, TORONTO.

### Professional Cards.

**M**CCARTHY, OSLER, HOSKIN & CREELMAN, Barristers, Solicitors, &c., Temple Chambers, Toronto Street, Toronto. Dalton McCarthy, Q.C., B. B. Osler, Q.C., John Hoskin, Q.C., Adam R. Creelman, T. S. Plumb, F. W. Harcourt, W. H. P. Clement, Wallace Nesbitt.

**B**LAKE, KERR, LASH & CASSELS, Barristers, &c., Millicamp's Buildings, Adelaide Street, Toronto, opposite Victoria Street. Edward Blake, Q.C., S. H. Blake, Q.C., J. K. Kerr, Q.C., Z. A. Lash, Q.C., Walter Cassels, C. A. Brough, C. J. Holman, H. Cassels, E. Maclean.

**K**INGSFORD, R. E., Barrister, Solicitor, Notary, &c. Office—Freehold Buildings, corner Court and Church Streets, Toronto.

**M**OSS, FALCONBRIDGE & BARWICK, Barristers, &c. MOSS, HOYLES & AYLES-WORTH, Barristers, &c. North of Scotland Chambers, 18 and 20 King Street west, Toronto. Charles Moss, Q.C., W. G. Falconbridge, N. W. Hoyles, Walter Barwick, A. B. Aylesworth, W. J. Franks.

**M**ULOCK, TILT, MILLER & CROWTHER, Barristers, Solicitors in Chancery, Practitioners in the Maritime Court, Conveyancers, &c. Office—South-west corner of King and Church Streets, Toronto, Ontario. W. Mulock, J. Tilt, N. Miller, J. Crowther, Jr.

## THOMAS CREAN,

### Merchant and Military Tailor,

MASTER TAILOR TO THE Q. O. R.

89 Yonge Street, Toronto

Price List Sent on Application.

## FISHER'S 25 CT. EXPRESS LINE

539 YONGE STREET,

(Just below St. Alban's Street, east side of Yonge.)

Baggage Collected and Delivered at Colleges, Railway Stations

AND IN ALL PARTS OF THE CITY.

☞ Checks given for Baggage to Stations.



## Reliable Watches, First Class Jewellery, and Electro Plate.

PURCHASERS WILL FIND IT TO THEIR ADVANTAGE TO CALL ON

# S. B. WINDRUM,

London and Paris House, 31 King Street East (Up stairs).

WATCH AND JEWELLERY REPAIRING A SPECIALTY.

Foot Balls and Boxing Gloves, Cricketing Outfit, and Tennis Goods.

Printed by ELLIS & MOORE, 39 and 41 Melinda Street, in the City of Toronto, and Published in the University of Toronto by the 'VARSITY PUBLISHING Co. Secretary, J. MCGILLIVRAY.

## JOHN MELLON.

Ten per cent. Discount to Students in

## BOOTS & SHOES

Gents' Boots made in latest styles and at lowest prices.

Repairing neatly and promptly done.

JOHN MELLON . . . . . 308 SPADINA AVENUE.

Only ten minutes' walk from University.

## A. C. M'KINLAY, L. D. S.,

SURGEON DENTIST,

121 Church Street, . . . . . Toronto.

TWENTY-FIVE PER CENT. DISCOUNT TO STUDENTS.

Demonstrator, and Teacher of Practical Dentistry in Royal College of Dental Surgeons, Toronto.

## HARRY A. COLLINS,

IMPORTER AND DEALER IN

## General House Furnishings

PEN, POCKET AND TABLE CUTLERY, ELECTRO PLATED WARE, LAMPS, &amp;c.

90 YONGE STREET.

AVENUE HOUSE,

Billiard Parlor in Connection.

448 Yonge Street, . . . . . TORONTO.

WM. J. HOWELL, PROPRIETOR.

## STUDENTS' GOWNS

Chemical Apparatus,

Mineralogical Cases,

Drugs, Patent Medicines,

BRUSHES, COMBS, AND TOILET REQUISITES,

## STUDENTS' EMPORIUM

274 YONGE STREET.

. A. SMITH, . . . . . Proprietor.

**GEO. ROGERS,**

IMPORTER OF

*Fine Gents' Furnishing Goods.*

SHIRTS MADE TO ORDER.

**DISCOUNT TO STUDENTS.**

345 Yonge Street, Cor. Elm St.

**G. & J. MURRAY,**

224 YONGE STREET,

**Importers of Study Lamps**

**AMERICAN OILS.**

**COLLEGE BOOKS.**

**COLLEGE BOOKS.**

The well known College Book Store, established by Mr. James Vannevar, in 1867.  
Special attention given to

*Toronto University Books,*

*Toronto School of Science Books,*

*Toronto School of Medicine Books,*

*Books both New and Second Hand.*

Students will make a great mistake who fail to give us a call.

**VANNEVAR & CO.,**

**Booksellers and Stationers,**

440 Yonge St., Opp. Carlton St., a few doors below College Ave., Toronto.

**W M. GRAHAM,**

**LEADING BARBER OF YONGE ST.**

Strict attendance to Students especially.

Opposite Yonge Street Fire Hall, - **485 YONGE ST.**

**ELDRIDGE STANTON,**

PHOTOGRAPHER,

**134 Yonge Street, TORONTO.**

**CABINETS, \$3.00 PER DOZEN.**

OLD PICTURES Copied, Enlarged and Finished in Colors, Ink or Crayon.

Orders Filled from any Negatives made by the Firm of STANTON & VICARS.



**COLEMAN & CO.,**

Hatters & Furriers

REMOVED TO

**71 KING ST. EAST**

Four doors east of  
Leader Lane.

**J. BRUCE,**

**ART PHOTOGRAPHER,**  
118 KING STREET WEST.

Guarantees the finest and most artistic work that can be produced, and allows a liberal discount to Professors and Students connected with Toronto University and other Colleges

**THE YORKVILLE LAUNDRY,**

695 YONGE STREET.

*All kinds of Laundry Work well and Promptly Executed.*

**H. D. PALSER,**

Proprietor.

Parcels sent for and delivered to any part of the City.

ESTABLISHED IN TORONTO FIFTY YEARS.

**E. DACK & SON,**

Manufacturers and Importers of Gents' Fine Boots and Shoes.

**73 KING STREET WEST (South Side.)**

As our business extends all over Canada, we would kindly ask customers to order in advance.

**THE DOMINION BOOK STORE**

SUTHERLAND'S,

**286 and 288 Yonge Street, TORONTO.**

Is the place to buy, sell, or exchange your books of all kinds.

*The Great Second Hand Book Depot,*

286 and 288 YONGE STREET, TORONTO.

**JOHN BRIMER,**

**MERCHANT TAILOR,**

210 YONGE ST., TORONTO.

**I. J. COOPER,**

IMPORTER AND MANUFACTURER OF

SHIRTS,

UNDERWEAR,

COLLARS AND CUFFS,

GLOVES,

SCARFS AND TIES,

HALF HOSE.

FOOT BALL, BYCICLE, TENNIS, LACROSSE, BOATING AND CAMPING JERSEY AND HOSE.

*Special College Discounts.*

**SPECIAL. MAKES**

ALL SIZES.

Latest Styles.

109 YONGE STREET,  
TORONTO.

# THE 'VARSITY:

A WEEKLY REVIEW OF

EDUCATION, UNIVERSITY POLITICS AND EVENTS.

Vol. IV. No. 14.

Jan. 26, 1884.

Price 10 cents.

## OUR FINANCES.

As the stage at which the question of University State Aid has now arrived, there is naturally a demand, on the part both of our friends and enemies, for a full detailed statement of our present financial position and of our financial needs. A knowledge of this is essential to an understanding of the reasonableness of our claim for further assistance. No more complete statement could be given than that contained in the carefully-prepared report presented to the Senate of the University, in January, 1882. Though presented two years ago, and though a few of the wants therein referred to have been supplied, or partly supplied, and a few of the suggestions acted upon, this report is in the main as true and reliable to day as it was when written. We re-publish it in full, and ask a careful examination of it by all who desire to get a satisfactory account of the subject with which it deals. It is as follows:—

*To the Senate of the University of Toronto.*

GENTLEMEN,—The committee appointed to report upon the income and expenditure of the University of Toronto and University College, and to consider the best means under the circumstances of improving the efficiency and extending the usefulness of these institutions, begs leave to submit the following report:

After due consideration of the whole question, it appears that the available resources of the University and University College are altogether inadequate to render these institutions as complete as they should be in regard to the strength of the staff, and all the aids and appliances necessary to the highest kinds of teaching. Whilst our poverty of means is to be regretted, it is, on the other hand, a matter for congratulation that there exists such abundant evidence of progress and of pressing necessity for greater activity to meet the intellectual wants of the country. Prominent among the causes which render urgent an addition to our forces may be mentioned the increase in the number of students and the considerable extensions which have recently been made in revising the curriculum to the various courses of study. Many new classes have thus been rendered necessary, and the labor of the instructors largely increased, more especially in connection with the practical courses in science and honor work generally.

There are, moreover, other and equally cogent reasons which point to the necessity for making additions to our teaching strength. In certain branches, such as constitutional law and political economy, students have not hitherto had the benefit of any teaching; and it is essential that instruction in these branches should not be neglected whilst they are considered worthy of forming a part of a liberal education.

Nor should we lose sight of the duty incumbent on the University of promoting the advancement of learning by offering every encouragement and facility to those graduates who desire to devote themselves to special lines of research.

Having regard to such considerations as these, your Committee is of opinion that the teaching staff should be much larger than it is at present, and should consist of separate professors or lecturers on Greek, Latin, French and Italian, German, English, Hebrew, History, Botany, Constitutional Law and Jurisprudence, Mathematics, Natural Philosophy, Mental Science, Chemistry, Physiology, Geology and Mineralogy, Zoology, Political Economy, together with a Demonstrator of Physics, a Mathematical Tutor, a Classical Tutor, and such other assistants as the numbers of certain classes might render necessary.

Besides this, there should be established certain fellowships, whose holders should have teaching functions, according to a scheme proposed at a subsequent part of this report. Nor can the institution be considered complete without the establishment of an observatory, in which event there would be added a professor of astronomy. Such

a scheme of re-organization would also necessitate a large expenditure on library, museum, and laboratories.

For the purposes of the University, there has for some time been a most pressing necessity for an Examination Hall, the numbers of candidates undergoing examination at the same time being now so large that they fill to overflowing Convocation Hall and all available lecture rooms. To all this is to be added the consideration of the question of providing facilities for the higher education of women.

The expenditure involved in such a reorganization as is indicated above, would extend far beyond the available resources of the institution, and it is submitted at present only with the view to the consideration by the Government of the question whether they would propose such an increase of funds as will enable a complete reorganization to be effected.

If the scheme for reorganization is to be confined to the present available resources, it becomes necessary to state what these are.

The income from the endowment for the year ending June 30, 1881, amounted to \$65,696, the main items of which are shown in the appended statement marked "A."

Some increase to the revenue may be expected during the next ten years, as park lots at present vacant are gradually brought under lease; and the sales of the comparatively small quantity of remaining lands throughout the Province will also afford some slight increase.

On the other hand, if allowance be made for the gradual reduction in the rate of interest, and for losses arising from loans and uninvested funds, it is possible that the income derivable from the endowment may be materially reduced.

The only other source of revenue consists of fees, which for the year ending June 30, 1881, were:

University.....	\$3,269 50
University College.....	3,327 00
	<hr/>
	\$6,596 50

which, being added to the receipts from the endowment, \$65,696, make a total revenue for the last year of \$72,292.50.

Dealing with the revenue for the next few financial years, the average income cannot be estimated higher than as follows:

From endowment and subject to charges presently to be mentioned.....	\$65,696 00
Fees on present scale.....	6,596 50
	<hr/>
Total.....	\$72,292 50

By an arrangement made some time ago to acquire certain University property for public purposes, a sum of \$20,000 of public money is expected to be placed at the disposal of the University on condition that \$10,000 of its own funds in addition (making in all \$30,000) are expended in the erection of a building for examination purposes and other objects absolutely necessary to the efficient working of the institution. This will involve a reduction in the income of \$600, being the interest on \$10,000. Deducting this sum from the above \$72,292.50, there would remain \$71,692.50, as the average annual income for the next few years, without allowing any provision for losses on investments, or by reason of funds being uninvested.

The expenditure for the current year including the payment of pensions, will, it is estimated, reach \$67,914; and it is not likely to be reduced during the next few years. This amount, it should be remarked, does not include any sum for extraordinary or unforeseen expenses. With regard to the amount (\$4,866.66) paid for pensions, it is to be hoped that several years may elapse before further charges are created under this head. It seems clear that some general equitable plan ought to be adopted, whereby contributions should be made by the professors, and other members of the staff, towards a superannuation fund, and the amount of allowance and conditions of retirement declared. In this connection it would be well to consider

how far the Canadian Civil Service Superannuation System, with such modification as the difference of age involves, on entrance, might serve as a basis.

It is possible that the plan of reserving a portion of the salary, and creating thereout a fund for each professor, bearing interest meantime, and payable, principal and interest, on retirement, might be more suitable. In view of the recent increase in the salaries, the present time seems especially suitable for the settlement of this question. Meantime the charge for retiring allowances must be placed at \$4,866.66.

There will be an increased charge for heating, and incidental expenses connected with the new Examination Hall, of about \$400. And it is proper to allow for such special expenditures as occur in most years, an average sum of at least \$1,000.

This brings the estimated expenditure up to \$69,314, as against an estimated revenue of \$71,692.50, leaving an estimated balance of only \$2,378.50.

These figures make it clear that the available margin is very narrow, and that even for the most indispensable improvements it may be necessary to propose a resort to the only remaining resource—an increase in the scale of fees.

The plan of improvement to be suggested is therefore limited as far as possible, and is confined to those points which seem most urgent and of most obvious importance, and to those methods of action which involve least addition to the expenditure.

The existing staff is as follows: *Professors*—Classics, Mathematics and Natural Philosophy, History and English Literature, Logic, Metaphysics and Ethics, Chemistry, Mineralogy and Geology, Natural History, Agriculture. *Lecturers on*—French, German, Italian, Oriental Languages. *Tutors in*—Classics, Mathematics.

It is proposed to establish in addition two lectureships—one in Political Economy and one in Constitutional Law and Principles of Jurisprudence; the salary of each lecturer being \$800 a year; and to appoint a Demonstrator of Physics at a salary of \$1,200 a year.

It is proposed, further, to inaugurate a system of fellowships, whereby graduates of approved merit and possessing special qualifications for teaching may, for a limited period, furnish most valuable assistance in the work of tuition, while they are at the same time engaged in pursuing some special line of study.

These fellowships should be held upon the condition of giving instruction under the control of the professor in the branch in which the fellowship is awarded, and should be granted by the Faculty with due regard to the merit of those available, and their fitness for the discharge of the functions for which the fellowships are created. It is proposed that each fellowship should be tenable for three years at a salary of \$500 a year. It is necessary that the number of these fellowships, and the departments in which they should be granted, should be settled with reference to the smallness of the available funds, and the urgent need for increased teaching power in certain departments, subject to such modifications and additions as changed circumstances and experience in the working of the new system may suggest. For the present, it is proposed that there shall be eight fellowships, allotted to the various departments as follows: two in Classics, one in Mathematics, one in Physics, two in Modern Languages with History, two in Natural Sciences. The annual charges involved in these proposals would be, for

Fellowships.....	\$4,000
Lecturers .....	1,600
Demonstrator of Physics.....	1,200
	\$6,800

From this sum, however, is to be taken \$700 already charged for the temporary appointment of a Demonstrator of Physics for the current year; so that the additional expenditure to be provided for under the above heads is \$6,100. The estimated available surplus, already stated at \$2,378.50, being taken from this, there would remain a deficiency of \$3,721.50.

To meet this deficiency, pending the possible improvement of the net income from the other sources referred to, it would seem that the only immediately available means for making the requisite additions to the teaching staff is an increase of the fees of the two institutions. As this can only be effected by the joint action of the two governing bodies, it is recommended that the Senate invite the co-operation of the Council of University College for the purpose of meeting the deficiency in question.

All which is respectfully submitted.

(Signed), WILLIAM MULOCK,

Toronto, Jan. 11th, 1882.

Vice-Chancellor.

STATEMENT "A."

Showing Capital and Estimated Income for Year 1881-82 (June 30.)

SOURCE.	CAPITAL.	INCOME.
Debentures.....	\$792,656 00	\$46,155 00
Mortgages.....	182,953 00	12,509 00
Sales of land, balances unpaid.....	49,523 00	2,971 00
Park rents.....		5,630 00
Other rents.....		600 00
Bank Stock.....		28 00
<b>Total .....</b>		<b>\$67,898 00</b>
Income as above.....		\$67,898 00
Bank account overdrawn, \$26,610 10; interest 6 per cent...		2,197 00
		\$65,696 00
University fees.....		8,269 50
University College fees.....		8,927 00
		<b>\$72,292 50</b>

STATEMENT "B."

Estimate for the year 1881-1882.

Bursar's office .....	\$ 2,600
Law costs.....	200
General incidents.....	200
Salaries and wages (including pensions, \$4,866 66).....	42,094
Scholarships.....	4,855
Examiners .....	2,750
Prizes and medals, University .....	850
"    "    College.....	400
<i>Printing and Stationery</i> —	
University.....	2,200
"    College.....	500
<i>Advertising</i> —	
University .....	100
"    College .....	50
Fuel .....	1,500
<i>Museums</i> —	
Natural History .....	880
Geological .....	100
Ethnological.....	100
Library.....	2,650
Water and gas.....	400
Building and grounds.....	3,000
<i>Incidentals</i> —	
University .....	150
College .....	150
Physical Laboratory .....	500
Chemical materials.....	100
Telephones .....	115
Rent—President's house.....	800
Insurance.....	1,700
	<b>\$67,914</b>

N.B.—The item of \$1,700 for insurance is not an annual charge, as that secures insurance for three years.

Of the changes suggested here, two have been accomplished; a number of fellowships have been established, and a Demonstrator of Physics has been appointed. The introduction of these new features in our teaching-staff was rendered possible by an increase in the scale of fees, a move certainly not free from objections, and opposed to the first principles upon which the University was founded. But the other pressing wants referred to still remain unsatisfied, and are becoming more pressing year by year. The additional Professorships indicated are now more and more called for. An Examination Hall, an extension of Residence, increased Lecture Room, additional expenditure on the Library, Museum and Laboratories, are surely needs which demand attention. That they are genuine needs, is beyond a doubt. The report shows that their consideration, upon the basis at present available, is out of the question; and they are submitted "only with a view to the consideration by the Government of the question whether they would propose such an increase of funds as will enable a complete re-organization to be effected." We think that for that consideration this Report contains much of the necessary material.

Editorial Notes.

We commend the communication of Mr. J. Playfair McMurrich to the intelligence of the undergraduates of the University. There is nothing more discouraging to the man desirous of being well read than to survey the vast ocean of literature before him and then realize that he can only gather pebbles on the shore. Of making books there was no end as long ago as in Solomon's time. The remark is truer than ever now. It is therefore important that some effort should be made to inform the reading public in a manner as condensed as possible what is being done in the world of letters. Mr. McMurrich's scheme is reasonable, and should be practicable. We are quite willing to throw open our columns to those who will try to carry it out. We must however depend on undergraduates to do so. Our correspondent has himself led the van by sending us a review which we have great pleasure in publishing. We trust it will be followed by many more from his own and other pens.

As appears from a notice in our advertisement columns the Annual Banquet will be held in the Pavilion, at the Horticultural Gardens, on Friday the 15th February. There promises to be a very large representation of graduates, and the undergraduates will turn out almost to a man. It was suggested in the last number of the 'Varsity that the Glee Club should take the vocal music in hand, and get up some good choruses for the occasion. Let us have 'Integer Vitae,' 'Gandeamus Igitur,' 'Litoria,' &c. If these once get a fair start the Philharmonic Society will have to take a second place,—in point of noise at least. Many graduates will no doubt take advantage of the fact that the University Conversazione is fixed for the night before, and the committees ought to bear in mind the necessity of providing extra accommodation for the increased numbers, and the desirability of making the proceedings as interesting as possible.

The University Club is being steadily agitated. Circulars are to be sent to all graduates in the Province asking several questions with regard to the formation of the Club. If the answers are satisfactory, and the guarantee reasonably responded to, steps will be at once taken to bring the Club into existence next Autumn by the opening of term.

From a note in our last issue it appeared that *Grip* had undergone a change of management. This was not correct. The change alluded to was merely one in the business of the firm, which rendered it advisable to print the 'Varsity elsewhere.

IN MEMORIAM.

EDGAR NORMAN HUGHES.

*Obit. Christmas, MDCCCLXXXIII.*

BY NEMO.

Reaper, could'st thou not pass by,  
Thou passest none, Oh! cruel Death,  
We come and go like fleeting breath,  
We little dream when thou art nigh.

In vain the Christmas day was bright,  
The winds went sobbing as they passed  
That Christmas morn; alas, the last  
Soon faded into sorrow's night.

From day to day we miss thy face,  
And look to meet thee in our halls,  
But memory soon the truth recalls,  
And points us to thy empty place.

And when the game is going fast  
Against the College on the green,

We'll miss thee most, for thou hast been  
Our fleetest foot, sure to the last.

And now, farewell, we sadly mourn,  
For thou art gone, ah! soon, too soon,  
The day has ended at the noon,  
And from us thou art rudely torn.

University News.

NATURAL SCIENCE ASSOCIATION.

A full meeting of the above society was held on Tuesday evening.

The paper read by the President on 'The mental faculties of man and the lower animals and their relation to physical development,' induced a warm discussion, so warm indeed, that some rather *wild assertions* were uttered.

The object of the paper was to show that an inferior animal possesses a mind as well as man, but which differs from that of the latter, by being developed in different directions; and that the statement that an animal has instinct is incorrect.

Mr. E. B. Kendrick explained the construction and use of the reflecting microscope by means of drawings and the instrument itself. Mr. J. B. Hammond followed with a dissertation on 'The importance of possessing a practical knowledge of the Modern Languages in an extended study of a branch of the Natural Sciences.'

MATHEMATICAL AND PHYSICAL SOCIETY.

A meeting of the Mathematical and Physical Society of Toronto University was held in one of the lecture rooms on Tuesday evening, Prof. Galbraith in the chair. Mr. N. H. Russell read a paper on Euclid, treating specially Book I, Proposition 47, proving this important proposition in twenty-six different ways. This is the first paper that has been read before the society by a member of the First year.

Messrs. Mulvey and McQueen, of the Fourth year, performed a number of very interesting physical experiments, such as the vibration of plates, rods and strings. Problems were solved by Messrs. R. A. Thompson and Wm. Sanderson, of the Third year.

W. J. Loudon, B.A., then introduced a motion, seconded by T. G. Campbell, B.A., 'That a committee be appointed to formulate a petition to be laid before the mathematical graduates of the University, for the purpose of founding a scholarship to be devoted to such purposes as the committee may decide upon.'

The motion was carried and a committee appointed to consider the matter.

The meeting then adjourned.

LITERARY AND SCIENTIFIC SOCIETY.

The first meeting of the society under the order of proceedings instituted at last meeting was attended by a large number of members. The Vice-President occupied the chair. Numerous notices of motion were made by Messrs. Holmes, Witton, Bowes, Weir, McGillivray, Fraser, McKenzie and Roswell.

The report of progress of the committee to consider the advisability of severing connection with the College Council from their prohibition of political discussions was submitted.

After reading the report Mr. Stevenson moved that the Committee be discharged. This brought forth a vigorous discussion between the revolutionary and the conservative portions of the Society.

Mr. L. P. Duff supported the motion in his usual forcible and lucid style. Mr. J. G. Holmes followed on the same side with a somewhat inconsequential speech, which was received with applause.

Mr. Weir advocated the adoption of the motion, on the ground that the object of the Society, as regards politics, should be to cultivate a knowledge of its principles rather than its details. Mr. Witton argued, on the contrary, that the Society should teach us how to apply principles to particular instances. Mr. G. W. Holmes supported Mr. Duff's remarks by referring to the deductive nature of politics. The motion was carried by a narrow majority.

Mr. J. G. Holmes raised a point of order, claiming the un-



constitutionality of the motion, and after lengthy and stormy discussion, was sustained by the chair.

This ruling was appealed from by Mr. Stevenson, but was upheld by the Society.

The motion of which Mr. McKenzie gave notice seems to afford a means of reconciling the discordant factions, and merits the careful attention of the members.

A closer attention to the points under question would have prevented much useless discussion and enabled the Society to proceed to the literary programme, which, from the length of the debate, was unavoidably left over.

After roll-call the meeting adjourned.

#### YOUNG MEN'S CHRISTIAN ASSOCIATION.

The first regular meeting of the College Association this term was held in Moss Hall at 5 p.m. on Wednesday, Jan. 16th, the committee having decided to hold their meetings on that day instead of Thursday for the current session. The attendance was above the ordinary, and much interest was manifested. Mr. T. C. Robinette addressed the meeting briefly on the topic 'True Wisdom,' using Job xxviii. 28 as his text, and adducing numerous passages in proof of his remarks. He dwelt on the means of acquiring wisdom by study of God's words and by prayer. He was followed by Mr. A. MacMechan, who spoke on Christ as being the embodiment of true wisdom and the necessity of keeping His life as an ideal constantly before us. The president, Mr. W. P. McKenzie then spoke on the practical working of the Association, and compared it in that respect with other college Y.M.C.A.'s, urging upon the members the necessity of earnest work, and after prayer the meeting closed with the benediction.

The usual devotional meeting was held this week in Moss Hall on Wednesday, at 5 o'clock. In spite of the storm there was a good attendance. Mr. A. C. Miles conducted the meeting. The topic was 'What think ye of Christ.' Matthew xxii. 42. He noted how men's thoughts had lately been drawn away from the discussion of dry dogmas to the person of Christ, the founder of Christianity; how the world had been benefited and civilization advanced by the advent of Christianity. He dwelt on the importance of giving an answer to this question, and the various answers given by those who are hostile, the thoughtless and the hesitating. The meeting now being open Mr. J. L. Gilmore spoke of the fact that all have to form an opinion of Christ sooner or later, and the advantages of making it now when He says 'Come unto me ye that are weary and heavy-laden,' instead of when he shall say 'Depart ye cursed into everlasting fire.' Mr. J. M. Duncan followed; he spoke of the union that exists between Christ and believers, compared in the Scripture to that between the vine and the branches, the head and the body; and this connection being so close should teach us the lesson of trust. The meeting closed with prayer.

#### QUICQUID AGUNT.

Messrs. G. H. Kilmer, B.A., '83, and J. Ross Shaw were in town this week attending the law exams.

Tobogganning is a favorite exercise among some of the students, several of them belonging to the Toronto Toboggan Club.

At the last general meeting of the Glee Club, Mr. J. F. Brown was unanimously elected as President in the place of the late Mr. Hughes, and Mr. A. Henderson was chosen in Mr. Bunn's place as fourth year committeeman. In accordance with a request from Richmond Hill, the Club decided to assist at a concert at that place on Feb. 7th.

Taking advantage of the splendid sleighing the Residence, to the number of thirty-two, on Tuesday night went out to Weston, about nine miles from here, in one of Doane's livery rigs, drawn by four horses, and accompanied by the usual number of tin horns, drums, cow-bells, etc. A pleasant time was spent at the Eagle Hotel, where an oyster supper was provided, and after a few speeches the party arrived home about half past twelve.

'Whereas, our late fellow-student and comrade, Edgar Norman Hughes, has been removed from our midst by the hand of Death. We, the members of the Toronto University Football Club, of which he was a prominent member, taking an active and energetic interest in both the field and management of this organization, desire to convey to his bereaved parents our heartfelt sympathy for them in the sudden and untimely decease of their son, who was respected and admired by all his fellow-students for his true worth and sterling character.'

The annual general meeting of the Rugby Union Football Club for the election of officers was held Wednesday afternoon in Moss Hall. There was a large attendance. Messrs. May, Wigle and McLaren were elected as delegates to the Ontario Rugby Union. R. G. McDonald was elected President, and H. B. Cronyn Sec.-Treas., and for the committeemen—fourth year, Messrs. R. O. McCullough, D. C. Little, and A. B. Thomson; third year, A. M. Macdonell, W. P. Mustard, and J. N. McKendrick; second year, A. G. Smith, H. B. Bruce and J. S. McLean. It was moved by A. S. May, and seconded by J. F. Brown—

### College News.

#### McMASTER HALL.

Mrs. McVicar entertained the students of the above institution last night. A very agreeable evening was spent.

Gilmore's Band hopes to be able soon to master the intricacies of 'Home Sweet Home.' At present they are waiting for the tin whistle to catch up.

The Theological Society met on the 18th inst. to discuss the question of the administration of the ordinances by unordained ministers.

The College was lately visited by Dr. Wheaton Smith, of Montreal.

#### KNOX COLLEGE.

We are pleased to see in our halls once more the genial countenance of R. Haddow, B.A., of the first year theology, who has been teaching for the past year in Cayuga High School.

On Thursday evening the 17th inst., the Glee Club gave a concert in Weston, under the auspices of the Presbyterian church of that village. The concert was one of the most successful in the history of the Club, and judging from the beaming countenances of our friends on their return, we would suppose that the hospitality shown them by the good people of Weston was all that could be desired.

The somewhat small list of Freshmen has been increased by the addition of Messrs. Ross and Sinclair of the first year University. All the available room in the College has been taken up.

#### CAMBRIDGE LETTER.

DEAR VARSITY,—The principal topic of conversation during the past week has been *The Birds*. Upon one point—that it was a great success—all agreed, but upon many other points of interest, which the reproduction of a drama so very respectable for age naturally brings up, none are agreed, for the simple reason, apparently, that no one knows much about them. The committee say in their preface that "the primary aim of the performance is academic," and that the main object is "not to achieve a dramatic success." But whatever the main object may have been, a dramatic success was most certainly achieved, and both the actors and the committee deserve a great deal of praise for the excellence of the performances. The chorus of *Birds* was most novel, as well as the most amusing feature of the comedy, and when nearly twenty birds of all kinds, in costumes 'which were astonishingly clever imitation of the original, first came fluttering on to the stage, the applause of the spectators was unbounded.' Speaking of this chorus, the *Cambridge Review* says:—'The grotesque, yet graceful bird-figures, moving to the irresistible dance-music, scattered in the picturesque confusion of the mock battle, or massed gorgeously beneath the outspread wings of the bird-king in the splendid finale, will be pleasant memory for a long time to come.' The music, which was composed specially for the occasion by Dr. Hubert Parry, has been so universally admired that it is being reproduced at the Crystal Palace on Saturday next.

Oxford is just now devoting all her dramatic talent to Shakespeare, the first performance of *The Merchant of Venice* by the Philothesians taking place last evening. It differs from previous academical performances, inasmuch as the female characters are personated by ladies, "the wives and daughters of the Dons" (to quote the *Times*), instead of by male undergraduates, as has usually been the case heretofore.

An attempt has lately been made to establish a Mediæval and Modern Language Tripos in Cambridge, but when the proposal was presented for the approval of the Senate a few days ago, it was rejected by the narrow majority of one.

And now, my dear 'VARSITY, I must bid you a long adieu. Our Christmas vacation begins this week, and in consequence of the lateness of Easter, it is a long one this year, so I shall not be able to write to you again until the 22nd January, by which time I hope to be back here once more. Allow me in conclusion to wish you a happy vacation yourself and also a Merry Christmas and bright New Year.

Yours as ever, T. C. S. M.  
St. John's College, Cambridge, Dec. 5th, 1883.

General College Notes.

PRINCETON.—Tuition has been raised from \$75 to \$100. Matthew Arnold lectures before University of Michigan Feb. 1st.

Galesville University was burned down on the 6th inst., the contents being saved. It is to be rebuilt at once.

Cornell University contains among its college portraits one of Prof. Goldwin Smith by the painter Carpenter.

A typographical error in our last number made 'Matthew Arnold lectured at Oberlin,' into 'lectured at Berlin.'

A portion of the engineering class at Ann Arbor University were present at the opening of the cantilever bridge at Niagara Falls.

Our Wallet.

THE 'VARSITY CALENDAR.

January,  
Begin,  
Scholarship  
Win.

February  
Comes,  
Student  
Bums.

March  
Blows,  
Time  
Goes.

April  
Cram,  
Coming  
Exam.

May  
Vexation,  
Exams  
—nation.

June  
Remember,  
Supplemental  
September.

When a man has no bills against him he feels as though he belonged to the no-bility, \* \* \*

A dude gazed intently at a giraffe for a few moments and turning sadly away, sighed: 'Oh! if I had a neck like that, what a collar I could wear.' \* \* \*

A gentleman travelling in Mexico sent one of the small native donkies called burros to a friend at home. The freight clerk thought 'burro' was an unsuccessful attempt to spell 'bureau,' and when his way-bills were all in, reported to headquarters, 'One bureau missing and one jackass over.' \* \* \*

Oh, J. Sullivan! Oh J. L. Sullivan! Oh, John Lycurgus Sullivan, all hail!!  
Thou bottomless infinitude! Thou God! Thou you!  
Thou Zeus with all compelling hand!  
Thou glory of the mighty Occident! Thou Heaven born!  
Thou Athens-bred! Thou light of the Acropolis!  
Thou son of a gambolier!

Fifty-nine inches art thou round thy ribs; twice twain knuckles hast thou; and again twice twain.

Thou scatterest men's teeth like antelopes at play.

Thou straightenest thine arm, and systems rock, and eyeballs change their hue.

Oh, thou grim granulator! Thou soul remover!

Thou lithsome, coy excoriator!

Thou cooing dove! Thou droll, droll, droll John!

Thou buster!

Oh, you! Oh, me too! Oh, me some more!

Oh, thunder!!!

Walt Whitman in Life.

ENERGY.

Read by J. M. Clark, B.A., before the Mathematical and Physical Society. (Continued.)

The next important names in the history of the theory of energy are those of Fourier and Carnot. The calculations and conclusions of these profound mathematicians were expressed, it is true, in terms which, to a certain extent, involved the now exploded corpulcular theories of heat and light, but their reasoning and results were to such an extent independent of any particular theory, that the elements involving the truth of these untenable hypotheses are capable of being almost entirely eliminated, leaving results which have proved of the greatest use in the development of the true theory of energy. To Clausius is principally due the credit of having thus utilized the brilliant investigations of these master minds, and in particular of having so modified the theorem of Carnot as to make it consistent with the doctrine of the equivalence of heat and work. To Joule, the great English Physicist, is undoubtedly due, as has been conclusively shown by Prof. Tait, the credit of having placed the grand law of the Conservation of Energy on a sure experimental foundation. Joule determined by means of some of the most ingenious experiments of modern times that 722 foot-pounds of work, if converted into heat, would raise 1 lb. of water 1 deg. F., or that to produce a quantity of heat sufficient to raise 1 kilogramme of water through 10 C., work must be consumed to the extent of 424 kilogrammetres, and thus placed the truth of the dynamical theory of heat beyond all manner of doubt.

In performing one of the experiments devised by him for the purpose of ascertaining the mechanical equivalent of heat, Joule discovered that current electricity was a form of energy, and subject to the law of conservation. His results were extended by Helmholtz, Mayer, Clausius and Thomson, till the law of conservation has been shown to govern all natural forces. Thomson demonstrated that Faraday's discovery of the rotation of the plane of polarization of a polarized ray of light produced by media under the influence of a powerful magnet, involved the dependence of magnetism on motion in the case of both magnetic and diamagnetic bodies. To Helmholtz and Carpenter is principally due the credit of having extended the principles of the conservation and transformation of energy to physiologic phenomena. There can be no doubt that Maxwell's electro magnetic theory of light is destined to play no unimportant part in the development of the true theory of Energy. From data supplied by Weber, Maxwell found that electro magnetic disturbances were propagated with the same velocity as light. The explanation of this he held to be that electricity, like light, was due to the undulatory vibrations of the medium which is beyond question necessary for the propagation of light.

If this hypothesis be found to be a valid one, a very clear insight will be obtained into the real connection between light and electricity. The relation of heat to light is seen by considering the nature of radiant heat, but is best shown by considering certain experiments of Leslie, which prove that bodies are heated by absorbing light. The fact that heat is developed in certain chemical transformations indicates the relation of the forces of chemical affinity to heat. Thus by considering in succession all the so-called natural forces, it will be seen that they are all simply manifestations of an unchangeable amount of indestructible energy. Every form of energy is capable of being transformed by suitable manipulations into all its other forms, without in any case involving any increase or diminution in the total quantity of energy. But while the quantity of energy in the universe is invariable, yet by virtue of laws of which we have a particular case in Clausius' second main principle of the Mechanical Theory of Heat, the amount of what may be termed available energy is being constantly exhausted. The truth of this, together with many important consequences which follow from it, was first

clearly pointed out by Sir W. Thomson, in a remarkably able paper 'On a Universal Tendency in Nature to the Dissipation of Mechanical Energy.' It is simply another method of saying that no known natural processes are perfectly reversible. Having thus briefly discussed the conservation, transformation and dissipation of energy, we propose concluding by investigating the sources of energy available for man.

A few moments' reflection will suffice to show that they are (1) Food, (2) Fuel, (3) Water Power, (4) Wind. Of these food and fuel are of the same nature, food being utilized by means of animal machines, such as men, horses, etc., while fuel is converted into mechanical motion by means of engines of various kinds. The kinetic energy which is thus produced by means of food and fuel is evidently derived from the heat and light radiated from the sun.

Water power and wind even more obviously obtain their energy from the same source.

Solar radiation is therefore the grand source whence nearly all the energy available for man is derived.

Various theories have been advanced to account for the enormous amount of energy in the form of heat and light annually sent forth by the sun, and of which the earth intercepts a very small portion.

It was by some supposed that the sun's heat was produced by the combustion of its materials. A very few facts will show that this hypothesis is utterly untenable.

The mass of the sun is approximately  $4(10)^{30}$  pounds. The consumption of a pound of coal is known to produce an amount of heat equivalent to 9,200,000 foot-pounds. Combining these, we see that if the materials of the sun were supposed to be capable of producing by their consumption as much heat as equal masses of coal—an assumption eminently favorable to the hypothesis in question—the total mass of the sun would be consumed in producing a quantity of heat whose mechanical equivalent is  $368(10)^{35}$  foot-pounds.

Further, according to the most accurate determinations of the amount of solar radiation, it is found that the energy radiated from the sun is very nearly  $(10)^{34}$  foot-pounds per year.

It follows therefore that if the theory of the origin of solar heat under examination were the true one, the energy of the sun would be completely exhausted in 3680 years, while there are reasons for believing that the quantity of heat radiated from the sun has been as great as at present for millions of years.

The theory of combustion or chemical combination therefore falls to the ground; and it is now generally supposed that the perennial fountain whence flow the enormous energies of the solar system is the potential energy of gravitation, which is converted into kinetic energy by its mass moving towards the centre of inertia of the solar system, and thence into heat by a mechanism indicated by the physical constitution of the fiery ruler of the day.

A few simple calculations will suffice to show that this hypothesis, which is now almost universally accepted by scientific men, predicates a cause amply capable of producing the results which it is supposed to explain, and that therefore it is not inconsistent with the axiom that the cause must be equal to the effect.

Taking the case of a spherical mass equally dense at equal distances from the centre, let  $\rho$  represent the density at distance  $r$  from the centre.

Taking proper units of force, &c., and remembering the theorem that the attraction of a spherical shell on an internal particle vanishes, it follows that the force acting on this elemental mass is  $4\pi\rho dr \int_0^r 4\pi\rho r^2 dr$ , assuming of course the Newtonian law of gravitation. The work done by this elemental mass moving through an infinitesimal distance  $dc$  will consequently be

$4\pi\rho dr \int_0^r 4\pi\rho r^2 dr \cdot dc$ . Integrating with respect to  $r$ , we get

as the total work done  $\int \left\{ 4\pi\rho dc \int_0^r 4\pi\rho r^2 dr \right\} dr$ , a formula which will be found of considerable use in solving several important classes of problems.

If we suppose  $\rho$  to be constantly uniform and that the radius of the sphere is originally  $a$ , it follows that if the radius becomes

$a-da$ , the amount of work done in consequence is  $\frac{3}{5} M_2 \frac{da}{a^2}$

when  $M$  is the total mass—of course a constant. Integrating this

expression between the limits  $a$  and  $b$ , we get as the amount of work done by a spherical mass  $M$  of radius  $a$  (supposed uniform)

contracting to a uniform sphere of radius  $b$ ,  $-\frac{3}{5} M_2 \left\{ \frac{1}{b} - \frac{1}{a} \right\}$

where the unit of force is obviously the attraction of unit mass on unit mass at unit distance. Applying this to the present condition of the sun, it will be found that a contraction of one foot in the sun's radius will produce sufficient energy to sustain the sun's heat at the present rate of radiation for about 1-10 of a year, or a decrease in the diameter of the sun of less than 20 miles would keep up the supply for 5,000 years. The most refined instruments would not be sufficiently precise to detect so small a variation.

Further, if the mass of the sun were uniformly distributed throughout a sphere of the same radius as Neptune's orbit, and were to contract to its present dimensions, the amount of heat generated would be represented by 228  $(10)^{39}$  foot-pounds, or sufficient to meet the present demand for over twenty-two million years.

This amount would be materially increased by taking account of the masses of the other bodies of the solar system, and of the fact that the sun must become denser as the centre is approached.

This vast quantity is amply sufficient to account for the heat which has been radiated into space by the sun and the other bodies composing the solar system, for the thermal energy now possessed by all those bodies, and for the kinetic energy they have on account of their revolutions in their orbits and on their axes. We have, then, what is known to be a *vera causa* shown to be capable of adequately accounting for certain facts, and we may legitimately infer the relation of cause and effect.

### CAINES' RECOLLECTIONS OF DANTE GABRIEL ROSSETTI.

Since the death of the poet-painter numerous biographical and critical notices have appeared, and of these by no means the least interesting is Mr. Caines' book, entitled "Recollections of Dante Gabriel Rossetti." In this work the literary side of Rossetti's art is considered, and his character and opinions are shown by numerous, and, as a rule, well-chosen extracts from his letters to the author. An ardent admirer of the poet, Mr. Caine corresponded with him for a considerable period before becoming personally acquainted, and by that correspondence an intimacy was formed which increased in later years to such an extent, that at Rossetti's request Mr. Caine took up his abode with him, and was with him almost constantly until his death. Perhaps then, with the single exception of Mr. Watts, no one has had such ample opportunities for observing the character, the artistic nature, the intense sensibility, and the literary likes and dislikes of the gifted poet. His aversion to forming new acquaintances, and his seclusion from the world were obstacles to a correct understanding of his life and thoughts, not usually found in the artistic or literary world, and it is only to a personal acquaintance or bosom friend that one can turn for a true picture of the man as he appeared when free from the embarrassments of public notice, though in opinions from such a source there is a disadvantage, arising from personal bias—shown in lavish and indiscriminate praise.

There is a possibility that the public will never obtain a true estimate of Rossetti's literary ability. To one unacquainted with his inner life, many of his poems appear to be the morbid outcome of a hypersensitive intellect, and to show too plainly the stamp of the 'fleshy' school. To an intimate friend, however, the excessive sensitiveness, instead of seeming morbid, is quite in keeping with the character and feelings of the man, and only throws more fully into relief his kindly passionate nature, while in the fleshiness such an one sees only his artistic admiration for the beautiful in all its forms, and his overflowing love for the mysterious in life and death. Accordingly one finds his adverse critics condemning certain of his works as unfit for the public eye, and his friends panegyricising and lauding them to the skies, no deliberate unprejudiced opinion being, as a rule, offered. It is only by a careful study of Rossetti's character, feelings, and opinions, as expressed in such a work as Mr. Caine's, that one can place one's self in a position to judge fairly and honestly the merit of his works.

The early death of his talented wife was a blow which crushed him to the ground, and it was the remembrance of this affliction that gave the peculiar weirdness to many of his poems

and sonnets. How great his loss was, few, apparently, can form a just idea, but some estimate of it may be gained from the lines which he himself translated, as being peculiarly applicable to his case—

Death, of thee do I make my moan,  
Who had'st my lady away from me,  
Nor wilt assuage thine enmity  
Till with her life thou hast mine own ;  
For since that hour my strength has flown.  
Lo ! what wrong was her life to thee,  
Death ?

Two we were, and the heart was one ;  
Which now being dead, dead I must be,  
Or seem alive as lifelessly  
As in the choir the painted stone,  
Death !

This affliction, and its overpowering reminiscences, must always be taken into account in estimating his poetry ; but in addition, the warmth of his Italian heart, his love of the quaint, weird, and antique, and, alas ! the dread curse against whose awful power he struggled without avail, all these have stamped their influence on his verses, and must be thrown into the scale along with them before they are pronounced wanting.

The poem that has called forth the greatest amount of hostile criticism and comment is that entitled 'Jenny.' Mr. Caine devotes several pages to a powerful defence of it, in the plea of its humanity, pointing out the evident desire of the poet that it should expose the injustice of the world to fallen sisters, inasmuch as the sin redounds upon the weaker vessel, leaving the stronger unpunished. As a moral lesson, Mr. Caine compares 'Jenny' to the sketch of Hester Prynne in Hawthorne's 'Scarlet Letter,' but perhaps with greater justice, since the object, the portrayal of the heinousness of the unmentionable sin, is the same, he might have referred to Mallock's 'Romance of the Nineteenth Century,' or Swinburne's 'Faustine.' These, though to a superficial reader they may appear in the highest degree immoral, are, in reality, among the most powerful denunciations of vice, and as such are more to be applauded than condemned. They do not belong to that class of works, of which the authors seem

'Skilled to make base seem brave,'

but show forth in their true lights the misery, shame, and despair, attendant on immorality.

If it be possible to particularize especially interesting portions in so interesting a book, attention may be directed to Mr. Caine's criticisms of English poets, and even more to Rossetti's opinions as to the relative standing of English sonnet writers, opinions all the more interesting as coming from one possessing a more than usually intimate knowledge of English sonnets of all periods, and who deserves to be ranked as one of the princes of the sonnet.

—AUDAX.

#### THE RELIABLE NEWS COMPANY.

On glancing over the list of 'Hotel Arrivals' the other day, my eye fell upon the name of, 'Col. Trewe, of the American Reliable News Company.' Wondering what the 'Reliable News Company' might be, I determined to call on Col. Trewe and find out. Accordingly, three o'clock found me waiting in the office of the Colonel's hotel, having previously sent up my card, to request the honor of an interview. Presently the messenger returned with a card, upon which was written 'Delighted to see you.' The jewel-bedizened clerk, having instructed the ebony call-boy to 'show the gentleman to No. 48,' I followed, and soon found myself in the presence of a robust, pleasant-faced gentleman, of some fifty years, apparently, who extended his hand cordially to me, and introduced himself as 'Col. Trewe, of the American Reliable News Company (Limited).'

I explained that I was engaged in the work of gathering news for one of the large dailies, I was anxious to understand the object and workings of the 'Reliable News Company,' with a view of profiting thereby. The Colonel smiled good naturedly, and said he supposed that I was rather amused by the name of the Company, and looked upon it as 'another ingenious Yankee dodge.' I replied that the strange and somewhat satirical name of the Company he represented, had somewhat piqued my curiosity. The Colonel smiled again, offered me a cigar, lit one himself, and settled himself comfortably in his chair ; while I took

out my note-book and pencil, and awaited the Colonel's pleasure. That gentleman, after taking several good pulls at his fragrant 'Henry Clay,' began :—

"To tell you the truth, the Reliable News Company, of which I am the General Manager and Secretary, has not begun operations yet. We are waiting for a very important event to happen,—some great capitalist to take hold of the concern, and start it. Once started, I have no fear of the ultimate success of the Company. The idea is entirely my own. The name—The Reliable News Company—exactly indicates the object and scope of my proposed organization. The aim will be to give to the public, by means of a system, analogons to Associated Press Despatches, really *reliable* news ; and accurate accounts of the various happenings in different places.

"Now, with us, in the States, and I suppose it is the same in Canada, it is almost impossible for the public to get a really accurate and thoroughly reliable account of any political gathering, any public meeting, any theatrical sensation, or any new enterprise. In the struggle for office, and passion for power and patronage, and, in a great many cases, in the struggle for daily bread, most newspapers are forced, either to conceal the truth altogether, or to garble it so, that the account given is about as reliable as Vennor's Almanac. Isn't that so ?" I was unable to deny the force and truth of his conclusions, so the Colonel resumed :—"Now what our Company proposes to do, is : To employ reporters of our own to get news ; or else, to pay the regular reporters of the daily papers to give us copies of their notes, and let us determine from these reports, the exact truth. Let me illustrate my meaning practically.

"Now, in a town of any size or account in our country, there are sure to be two newspapers,—one Democratic, and the other Republican. Well, as a natural consequence each paper magnifies and praises the doings of its own party, and belittles and satirizes the acts of the opposite party. Now, this being the case, how are the public to get at the truth ? You most naturally say, 'by reading both papers.' Not so fast, my friend. You must remember that neither paper ever tells the truth, even about its own party, and much less about the opposite party ; it is manifestly useless to try and arrive at the truth by simply reading two garbled and untruthful accounts of the same affair, each of which will differ from the other in every particular. Besides, it would be rather too expensive a plan, to compel every man to subscribe for two daily papers in his own town each year, wouldn't it ? No ; the way we propose to go to work is : To employ in our Bureau of Reliable Intelligence, two red-hot, uncompromising Democratic reporters, and the same number of equally red-hot, and uncompromising Republican reporters. For instance, we send them to a political meeting, and when they come back they simply transcribe their notes and send them up-stairs to our Editorial Department, and that's all *they* have to do. Our editors, not the reporters, prepare our despatches, you know." Here Col. Trewe smiled sarcastically. "Well, (and here the Colonel took a piece of paper and a pencil), to illustrate our methods practically :—there are four different reports of this meeting lying before our editor ; all are written by men who have had no communication the one with the other while preparing them. Now, the editor who is writing our despatch, adds up the various figures which the reporters have written down as representing, in their estimation, the number of people present. Let us suppose the first reporter says there were 500 people at the meeting. Down that goes. The second says, only 350. Put that down. The third thinks that only about 200 people were in attendance. Put that down also. The last says, 400. Down with that, too. Now we add these four numbers up, viz : 1450. By taking the average, we find that there were exactly 367½ people present. Then we read over each report carefully, and note down the number of times the words, 'cheers,' 'hear, hear,' 'applause,' 'tremendous and long-continued cheering,' 'sensation,' etc., occur in the various reports, and, by striking our invariable average, we find out the political complexion of the meeting, and thus get at the real truth. We, of course, insist upon our reporters taking down the speeches *verbatim et literatim*, so that we can publish them exactly as they were delivered. Thus we give what the speakers really said, not what the reporters thought, or wished them to say.

Then in regard to dramatic criticism. We never take complimentary or 'dead-head' tickets. If we did, we would have to give uniformly brown-colored reports of the performances,—always laudatory. No ; we send competent reporters, pay their bills yearly at the theatres, and consequently are enabled to give