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VOL. XX.

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NO. 14.

University of Toronto

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TORONTO, JANUARY 22, 1901

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ARSITY

A Weekly Journal of Literature, University Thoughts and Events.

VOL. XX.

UNIVERSITY OF TORONTO, JANUARY 22, 1901.

No. 14.

A CENTURY OF BIOLOGY.

BY PROF. RAMSAY WRIGHT.

An eager reporter once asked me to impart to him the science of Biology in a nutshell. It is a more modest demand that I should furnish an account of its development in the 19th century within the space of a column of THE VARSITY, and yet one to which I feel myself inadequate. Still, something may be said about it, and a form occurs to me in which I may say that something.

There stands in the vestibule of the Biological Museum a polished section of Douglas pine, nearly eight feet in On the assumption that its "annual" rings diameter. are in reality annual, it may be calculated to have lived for upwards of five centuries, and

had already attained a thickness of two feet when the Cabots sailed up the St. Lawrence. It occurred to me to use its surface for an illustration of the chronology of Biology, and accordingly some interesting names and dates have been inscribed on the corresponding annual rings. During the 19th century the rings are much crowded, and it has therefore been necessary to select with care the representative names, so if I justify my selection I shall incidentally indicate some of the more important lines of biological progress.

By a happy coincidence the term Biology is about to celebrate its centenary. It was first used in 1802 by Treviranus in his "Biology, or the Philosophy of Living Nature," a book inspired by dissatisfaction with the drybut necessary-systematic labours of the followers of Linnæus, and an eager desire to penetrate the secrets of life, and to arrange in a harmonious system what was

known of its phenomena and laws. We need not enquire how far he was successful. He himself allows that new discoveries will certainly invalidate some of his conclusions, but comforts himself with the reflection that it is better to be shipwrecked in a noble undertaking than to be successful in a mean one. He might have been consoled by the quotation :

"In magnis voluisse sat est."

His contemporary, Lamarck, must also have been stimulated by the advent of the new century to ponder the common properties of plants and animals, for in the same year he employs independently the same term with the same meaning. The French biologist undoubtedly

the century than it did on that of the first half. In it the doctrine is first clearly enunciated that the species of plants and animals living on the surface of the earth are modified descendants of those living on it in past geological times, and the causes of such modification are sought in the influences of the environment, and in the transmission to the offspring of the effects of use and disuse. But the doctrine of Descent with Modification only became an

gained a better point of view into the relations of living

things than his German colleague, yet his "Philosophie Zoologique," published in 1809, has exercised more

influence on the scientific thought of the last quarter of

important factor in scientific thought after the appearance of Darwin's Origin of Species in 1859, in which Lamarck's explanation is scouted, and that of the variation of offspring in all directions, and the survival of the most adaptive variations substituted. The influence exercised by Darwin's book was due not only to the exhaustive treatment by a judicial mind of the available evidence on the subject, but largely to the propagandismoften very militant in its tone-of Huxley in England and Hæckel in Germany. As a result the doctrine of evolution quickly penetrated scientific thought, and, passing almost from the hypothetical to the axiomatic stage, became indeed its "Leit-motif." The point of view sighed for by Treviranus was gained.

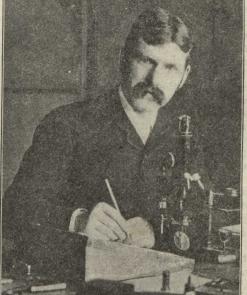
Not that the world was standing still between Lamarck's time and Darwin's. Evidence had been accumulating from various sources

which converged to favor the acceptance of the revived doctrine. The comparative morphology of organisms, for example, developed by the researches of Cuvier, Owen, Robert Brown and others, furnished evidence of a unity underlying diversity-apprehended by the keen eye of Goethe, morphologist as well as poet, when he sang

"Und es ist das Ewig Eine das sich vielfach offenbart."---

which now for the first time, under the conception of blood-relationship, was provided with an interpretation satisfying to the mind.

Émbryological data furnished by von Baer and Rathke, palæontological data accumulated in the investigation of the earth's crust, all now seemed to fall into a



PROF. RAMSAY WRIGHT.

harmonious system. But it is to microscopic researches that we owe the most striking manifestation of the "Ewig Eine" of the organic world, because these demonstrated a fundamental agreement in structure between plants and animals which was not dreamt of at the beginning of the century.

Although the microscope had been applied during the two preceding centuries to the study of the minute structure of plants and animals, and although Bichat at the beginning of the century made such notable progress that he has been named the father of modern histology, yet Schleiden and Schwann may be said to have inaugurated in the early forties a series of researches into the "cellular" structure of organisms which has culminated within recent years in the most far-reaching discoveries regarding the most secret internal movements of their elements, disclosing the most surprising agreement between plants and animals, both in the origin of new constituent cells and the early history of their eggs. Truly, Treviranus would be at no loss for a point of view to-day.

Not only was the structure of organisms living and extinct questioned as to the applicability of the doctrine of evolution, but also their distribution on the surface of the earth, and thus was initiated a new line of geographical researches, already pioneered by Humboldt. What had been established as to the wonders of the life of the ocean by the earlier investigators of the century such as Chamisso—for Gœthe is not the only poet-naturalist worthy of mention here—merely stimulated fresh enquiry, with the result that expeditions like those of the Challenger have much extended our knowledge in this direction.

Perhaps the most interesting among the results recently obtained is that which has explained to us the cycle of organic life in the ocean. On land the forests and plains furnish the food for hosts of phytophagous animals which again are preyed upon by carnivorous forms. In the sea carnivorous creatures, great and small, seem to predominate. Whence comes the initial food-supply for them? "Plankton" studies have shown that even in the icy seas of the polar regions the vegetation of the ocean is amply adequate for the support of its teeming animal life, but it is embodied in organisms of the humblest structure, which make up in numbers for their microscopic size, while the herbivorous animals which feed upon these are also numerous and inconspicuous.

If we owe to the improved microscope of the 19th century the sharper insight into life-processes referred to in the preceding paragraphs, it is no less true that it has opened to us an entirely new world of infinitely minute plants and animals, the investigation of which has yielded results which will be remembered as the chief achievements of the biology of the 19th century. Beginning with Pasteur's study of the silk-worm disease, his investigations on the organisms involved in fermentation and putrefac-tion, his refutation of "spontaneous generation," and continuing with the resultant improvements introduced by Lister in the treatment of wounds, the establishment by Koch of the parasitic origin of the infectious diseases, the economic applications of bacteriology, the revelation of the rôle played by "nitrobacteria" in the soil, down to the discovery of anti-toxins and the complicity of the mosquito in distributing malaria, we have in the latter part of the 19th century a series of brilliant researches of the widest theoretical interest and of far greater practical importance than those referred to at the beginning of this article.

Returning, in conclusion, to the speculative aspect of modern biology, we may detect as a *fin de siècle* characteristic the tendency to leave aside for the time being the discussion of Darwinian and Lamarckian factors, and to interrogate Nature directly as to the causes of evolution. Such is the attitude of students of the "mechanics of development," but years of patient experiment must precede any attempt to estimate their results. Perhaps my successor, who will sum up for the VARSITY of January, 2001 the achievements of biology in the 20th century, will be able to dispose of these in a few words, but we may confidently anticipate that experiment will yield more lasting contributions to knowledge than much of the speculation which has hitherto prevailed.

OPTICS IN THE NINETEENTH CENTURY.

By G. R. ANDERSON, M.A.

Long ere the dawn of civilization a number of facts relating to light must have been forced on the observatiou of prehistoric man—the alternations of day and night would indicate that the sense of sight was dependent on something coming from the sun—the shadows cast by various objects would show that this light must travel in straight lines—and the images of surrounding objects in still water would be a subject of thought to even the crudest intellect. Notwithstanding the fact that the laws of optics are everywhere in evidence the progress of the science has been very slow, nearly all the important work having been accomplished in the last three centuries.

In the sixth century B.C., Pythagoras had formulated a theory of vision similar to what was twenty-two centuries later developed by Newton and known as the emission theory of light, according to which it was held that vision was produced by particles projected on the retina of the eye from a luminous body. This doctrine was attacked by Aristotle about 350 B.C., who held that light was not a train of material particles but an action of a medium which he called *diaphanes* and here we have the first intimation of the now universally accepted undulatory theory which was developed during the nineteenth century. Other ancient writers, among them Plato, Ptolemy, Euclid and Cleomedes, treated of optics, and in Arabia considerable attention was given to the subject about the twelfth century.

The seventeenth century was marked by a number of discoveries of the utmost importance, to wit: the introduction of the telescope, the determination of the velocity of propagation, the laws of reflection and refraction, the analysis of white light by the prism, the foundation of the wave theory by Huygens and its application to the explanation of double refraction. Newton combated the wave theory and adopted the emission theory by which he was able to explain the phenomenon of polarization which did not appear to him explicable on the assumption that light was produced by undulations.

Coming to the beginning of the nineteenth century we find things very much in confusion. Newton had formulated his corpuscular or emission theory, and in order to explain certain phenomena of interference had been forced to invent various supplementary theories resulting in arbitrary laws for which there appeared to be no plausible reason. The wave theory, as already stated, was assumed by Huygens, but there were many difficulties in the way that had hitherto prevented its acceptance, notably in the matter of rectilinear propagation and polarization. The researches of Dr. Young on interference about 1802 successfully disposed of one of these difficulties and paved the way for future discoveries along the same line. It is to Fresnel that the chief credit must be accorded for placing the wave theory on such a footing that the older emission theory became at once and forever a matter of history. In a series of remarkable papers issued between 1815 and 1827, he disposed of the objections to the undulatory theory, explained the phenomena of

diffraction, interference, double refraction and polarization, and collecting the various scattered and apparently contradictory results of past observers, welded them into a homogeneous whole, dependent only on the laws of propagation of transverse vibrations in a uniform medium,

From the time of the publication of Freshnel's researches the progress of optics was rapid. Arago and Jamin devoted considerable attention to interference phenomena and successfully applied the method of inter-ference to measurements of precision, a method that has been brought to great perfection during the last two decades by Michelson and Morley. A good deal of work has of late been done in the direction of establishing a connection between light and electricity. Maxwell has shown that electric stress is propagated with a velocity identical with that of light. The presence of electric waves radiated by the oscillatory discharge of a condenser was detected and their behavior examined by Hertz in 1885 and subsequently by Lodge and others. It has been shown that these waves may be reflected, refracted and polarized similarly to light waves. In 1845 Faraday disdiscovered that certain kinds of glass when subjected to the action of a magnetic field produced a rotation of the plane of polarization, and further discoveries extending the action to most diamagnetic bodies have been made by Becquerel and others. Dr. Kerr has further shown that a similar result is obtained when the medium is under electrostatic strain and that the polarization of light is changed by reflection in a magnetic field. In 1897, Zeeman made the remarkable discovery that the spectra of incandescent gases are greatly modified by a powerful magnetic field, the lines being sometimes broadened and in other cases single lines separated into two or three distinct lines, and that these are polarized in various wayswhere doublets are formed they are circularly polarized in opposite directions, and where triplets are formed the center one is plane polarized and the others circularly or elliptically polarized. All these results point unmistakably to a relation of some sort between light and electricity which is an interesting problem for the future.

Perhaps nothing more clearly shows the progress of science in the nineteenth century than the perfecting of the method of spectrum analysis. The presence of dark lines in the solar spectrum was first observed by Wollaston, and they were examined minutely and mapped by Fraunhofer about 1815. Brewster, Foucault and others attempted an explanation of these dark lines, but the full significance of the discovery was brought out by the researches of Bunsen and Kirchoff about 1860, by which it was shown that these lines in the solar spectrum indicate the presence of certain elements in the sun's atmosphere. The method of analysis by this means has been developed to the greatest perfection, so that we are able to detect the presence of the minutest trace of an element in a compound or determine the composition of the fixed stars with equal facility, nay more, we are even able by this means to determine the relative motion of the heavenly bodies and even to make certain approximations in regard to their temperature.

The chemical action of light on certain substances, notably the salts of silver, was long ago observed. The subject was investigated by Scheele, Davy, and Wedgewood, but it was not till 1839 that Daguerre succeeded in fixing the image of an object impressed on a sensitized surface by a lens and thus laid the foundation of the art of photography which is of so much importance at the present time. We have three well marked epochs in the history of photography : First, 1839 to 1851, the period of the daguerreotype; second, 1851 to 1871, the period of collodion plates; third, 1871 to present, the period of gelatine emulsion plates and modern printing processes. The problem of polychrome photography cannot yet be said to be completely solved, but pictures in color may be obtained by certain mechanical devices, chief among which may be mentioned the interferential method of Lippman and the various tricolor processes at present in use, while Prof. Wood has obtained color effects by a process of diffraction, the picture being merely a grating variably spaced according to the color of its different parts.

Photography is simply invaluable in researches where results are to be recorded on a "retina that never forgets." It serves to record the continuous variations of instruments used in meteorological work; in connection with the microscope it delineates the minutest organisms. In connection with the telescope it seeks out and maps with unfailing accuracy the myriad stars in the depths of space, and as an adjunct to the spectroscope it serves to detect and record the minutest changes in the position of the spectral lines by which the movements of these heavenly bodies may be determined.

Such is a brief and imperfect sketch of the results achieved. What does the future promise? A well known scientist has said that "future results in physics are to be looked for in the sixth place of decimals"—this means of course work of the highest order. Perhaps the first thing to be attained will be the complete establishment of an electro-magnetic theory of light, and when that is accomplished and the nature of electric phenomena is better understood, many things in optics that are now obscure will be made clear.

THE "LIT."

The Society was called to order in good time and business despatched with expedition.

The Conversat committee reported that the date for that function had been fixed for Friday, Feb. 15th. The price of tickets was settled at—Gentlemen, \$1.50; ladies, \$1.00, and the number to be issued will be limited strictly to 500, so that all crowding shall be obviated.

The following recommendations were adopted by the Society :---

1. That the request of the Queen's debaters to hold the Queen's-Varsity debate on Feb. 8th, be acceded to.

2. That a business meeting be held on Friday, Feb. 1st, at 4 p.m.

3. That the Society empower the Executive to take steps towards the formation of a Debating League between McGill, Queen's and Varsity.

4. That the final debate between the Third and First years be held on Feb. 22nd.

The revision of the constitution was then proceeded with and fully one-half of it finished, with several modifications of the recommendations of the committee. The most important change was the referred clause which dropped out the School of Science from the "Lit."

NORMAL COLLEGE.

The spring term opened Jan. 10th, but the students as a whole were not back until Monday, Jan. 14th. This year the Varsity graduates are in a decided preponderance, there being out of a total of forty, thirty-three from Toronto.

During the fall term athletics largely occupied the minds of the students. Our Association football team under Captain Whitely showed the people of Hamilton and vicinity some of the fine points of the game, and incidentally won the handsome Spectator cup.

Mr. G. W. Ferguson, B.A., represented the College at Victoria University At-Home. R. Y. E.

COLLEGE GIRL

Superintending Editor, Miss F. M. Wicher, 'or.

January has again closed down upon us and, as in past years, it finds the college girl bending closer and closer over her books as the days go by. Her elbows are becoming daily more inured to the hardness of tables, and the pity of it is that the tables will go on increasing in hardness as the elbows decrease in plenitude of covering. Such is the fate of the college girl.

But perhaps it is too early to make forecasts of the "spring scare"; for as yet we do not speak of it openly, though in our secret hearts I think each of us acknowledges the shadow of its presence. We feel that for the next four months

> "Nothing can bring back the hour Of splendor in the grass, of glory in the flower."

We have lost the zest of October, and the sterner resolutions of January, though they take the place of zest as far as actual hard work is concerned, yet they fail to bring with them the enthusiasm that made work a joy. In short, the college girl is tired, and she knows it as no one else can know, and more, she realizes that there is no rest this side the May examination.

To the majority of us it was a genuine surprise to find when we walked into the Library the first day of the new term that our view of half the reading room was cut off. Now, however, we have become accustomed to the barricade and have grown to like it. Indeed, from the first we took to it kindly. There is one disadvantage about the book-case, it renders it rather hard to discover the cause of the stamping on the other side of the tableand this of course is an insufferable state of affairs 10 us whose prerogative it is to be curious.

There is a phase about the barricade that probably was not intended by the authorities. It promises to develop a new science, that of Footology. It is the most picturesque sight imaginable to behold a row of No. ----'s reposing blissfully beneath the opposite tables. There they rest in all attitudes, toes turned in and toes turned out, turned up and turned down, over and under, sitting primly side by side, or placidly showing the whole expanse of a sole that lacks in all things save expansiveness. In former terms we scarcely realized that men had feet, now we are inclined to question the existence of their heads.

It is an employment most interesting for those who sit at the table next the shelves to watch the progress of a pair of feet, more or less huge, moving with more or less stateliness-and by the way, feet betray possession or lack . of dignity-steadily or wobblingly down the first aisle of the neighboring territory; and it is the hightest satis-faction to see the owners of the said encumbrances emerge finally from their partial cover, and stand exposed to view in the full light of the upper or lower common ground.

The progress of this new science has been rather rapid. Already all tan clad feet are unmistakably located, and black clad ones will doubtless soon succumb to the steady attacks of scientific method.

Although thus far the Easter term among the girls has been comparatively devoid of events of a relatable character, yet from sundry rumors it bids fair to be so not long. The Women's Literary Society is preparing to hold its spring reception, and the girls are busy ruminating upon their invitations, trying to decide to whom they owe most in the way of social entertainment. It is a problem; but through all things in life there runs a system of compensation, and doubtless in solving the problem this divine plan

will be held to in the main, in respect of those lacking invitations, as well as of those receiving them.

Last Wednesday afternoon the Y.W.C.A. held its regular weekly meeting. The topic under discussion was "Hindrances to Serving Christ," with "The Perils of College Life" as sub-topic. The meeting was thrown open to the Association, and several of the women spoke of hindrances that they themselves had found.

The topic for next Wednesday is "The Business of our Lives" and from its very nature we trust that the meeting will be well attended. Every girl is welcome.

F. E. B.

CHESS.

The Chess Club gained its first victory in two years in the match at the Y.M.C.A. parlors on Thursday, Jan. 10th. The games were very keenly contested and resulted as follows :---

VARSITY.	Y. M. C. A.	
Hunter $\frac{1}{2}$ Shenstone \dots I	Dr. Meyer $\frac{1}{2}$ Branton	
Gould $\frac{1}{2}$	Powell	
Prof. Mavor I	Smith ō	
Gibson 1	Williams o	
Beck 1	Carter o	
Clappison 1	Crompton o	
Keith I	Priest o	
	_	
7	I	
This match puts Varsity oven with the City Athlet		

This match puts Varsity even with the City Athletic Club for the city championship.

THE CALENDAR.

Tuesday, January 22.---

8 p.m.-Varsity vs. McMaster-Students' Union. Thursday, Jan. 24.-

5 p.m.-Y.M.C.A. 8 p.m.-Inter-College Club-Y.M. C. A. Building.

Friday, Jan. 25.— 8 p.m.—Oratorical contest—Students' Union.

Saturday, Jan. 26.-

3 p.m.-Saturday lecture, Prof. Lang-Chemical Building. 4 p.m.—Lecture by Mr. A. Blakely— Victoria College chapel.

Sunday, Jan. 27.--3.30. p.m.-Postponed sermon by Dr. Milligan-Students' Union.

Monday, Jan. 28.-

4.10 p.m.-Lecture by A. Carruthers - Chemical Ampitheatre.

TO ATHENÆ.

Poor Leus & Co. have fallen from grace, Nor longer play their parts, But dear Athenæ holds her place Enshrined within our hearts.-M. H. B.

A CHANCE FOR CANADIAN TALENT.-With a view to encouraging the development of a literary spirit in Canada, The Ladies' Magazine, Toronto, is offering cash prizes for the best short stories by Canadian writers. The competition is well planned, and further particulars are given in the January number of the Magazine. A photographic competition is also announced, and cash prizes offered.

SIR JOHN BOURINOT.

CHARACTER SKETCH.

Hon. Sir John George Bourinot, LL.D., Clerk of the Canadian House of Commons, was born in Sydney, N.S., on October, 24th, 1836. His father, the late Senator Bourinot, was for many years a prominent man in the Maritime Provinces.

Dr. Bourinot, after being tutored at home was sent to Trinity College, Toronto, where during his course in Arts he distinguished himself in his classes, and gave promise of a bright career. Graduating from Trinity in 1858, his

literary instinct naturally led him into newspaper work, and he accepted a position as parliamentary reporter for a leading newspaper. In 1860, he resigned this position for a more important work, and became the founder and chief editor of the Halifax Reporter. From 1861 to 1867 he filled the important office of Chief Official Reporter of the Nova Scotia Assembly. This training fitted him in a special manner for the important offices he has occupied in the House of Commons. Entering the House as shorthand writer in 1868 he advanced rapidly, until in 1880 he was appointed Chief Clerk, the office which he still fills with great credit and efficiency.

Dr. Bourinot has been one of the most important figures of Canadian public life. He is well known not only as the greatest authority on the Canadian constitution, but as an important contributor to Canadian literature, on national and constitutional subjects. His works have received high commendation in Canada, Great Britain, Australia, and the United States, and he



SIR JOHN GEORGE BOURINOT, LL.D

has become popular throughout the British Empire as an ardent advocate of Imperial Federation.

The one aim of all his literary work, and the desire of his life seems to be to create a love for Canada and Canadian interests, and he has done much for his native land, in making her better known to the British world.

Dr. Bourinot has had many honors bestowed upon him. In 1887 he received the honorary degree of LL.D. from Queen's University, Kingston. He is hon.-secy. of the Royal Society of Canada, hon. cor.-sec. of the Royal Colonial Institute, a Fellow of the Statistical Society of London, and received the honor of Knighthood in 1898.

> R. J. Y., '02. Gourge Ar

SIR JOHN BOURINOT'S LECTURE.

One of the most interesting lectures of the academic year was delivered before the Political Science Club in room 4, on Friday afternoon last by the eminent authority on constitutional history, Sir John Bourinot, his subject being "British Rule in Canada.

The lecturer on being introduced by Dr. Wickett expressed his appreciation of his privilege in addressing the students of Toronto University. By way of introduction he recalled the distance the American people had moved from their early republican principles. He referred

especially to the ideals of the U. E. Loyalists, which appeared to him to forshadow the present C an adian constitution. The constitutional relations existing between Canada and the Motherland were graphically outlined, and the theoretical supremacy of the Imperial power with the practical independence of Canada in her local affairs noted.

The similarity of the Canadian system of government to that of the Motherland in many important respects was pointed out, and this similarity emphasized by being contrasted with the more democratic constitution of the new Australian commonwealth."

In conclusion Sir John expressed the conviction that no country gave more evidences of substantial progress than Canada, and prophesied t h a t that that force which for over a hundred years had kept Canada separate from the United States would ultimately result in winning for her a recognized place in the central councils of the Empire.

A vote of thanks was happily moved by Prof. Wrong and second-

ed by Mr. Wm. Craig, ex-M.P., for East Durham.

[We are indebted to the Copp, Clark Co. for the cut of Sir John Bourinot.—Ed.

A small but quite enthusiastic number of Varsity girls met on Friday in the Ladies' reading room, and definitely organized a Hockey Club. The following officers were elected: President, Miss. M. E. Marshall, '02; secretary-treasurer, Miss Fortner, '03, and first year representative, Miss P. H. Guthrie. Through the kindness of Mr. Telford suitable hours have been obtained for practice at the rink, and if the ice last, practices will begin this week.

The **Barzity**

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TORONTO, January 15th, 1901.

EDITORIAL.

Those who have taken any great interest in the questions which have been discussed during the Michaelmas term cannot have failed to note how frequently comparisons were made with, or instances cited from, other The reason is obvious. Mr. S. H. Blake universities. freely used them in his address, especially when dealing with the financial aspect; they have served as illustrations to enhance the advantages to be derived from the prospective Undergraduate Club; appointments of graduates have been used as a criterion by which the success of a university may be judged; in fact in nearly all our difficulties we point to others to show the good or evil which will result from any proposed policy. The frequency of this plan will justify us in opening an exchange column, under the designation of "Among Other Colleges." A lot of valuable information about our sister institutions is to be obtained from the exchanges and it is our purpose to give the undergraduates the benefit of this.

* * * *

Speaking of American exchanges, we fear that justice is not done to the mother land. Our literary market is flooded with American journals and magazines, good, bad and indifferent, and we are naturally greatly influenced by them. Some of the methods and forms adopted would not be sanctioned by reputed English editors whose opinions ought to have very great weight with us. At present we have but one exchange from Great Britain, viz.: the *Glasgow Journal*, but we trust that very shortly we will exchange with all the leading universities of the British Isles. It should be a potent influence for good upon all writers here. Some of the exchanges have excellent articles and any undergraduate who wishes to peruse them will find them on file at the office of the VARSITY, to which place there is a standing invitation to all.

* * *

We positively cannot insure the publication of any contribution if the author thereof does not disclose his name. A nom de plume may be used, but it is always preferable for a writer to acknowledge his sentiments. All MSS. should be left at the Janitor's Office not later than noon of the Friday prior to the day on which the number in which it is desired to publish it, will be issued. We deeply regret that the notice of the death of G. C. McCollum was not inserted last week, as it was expected.

Owing to unusual press in space this week we have been compelled to cut down the editorial.

* *

44

We regret that G. F. McFarland, former sporting editor, has found it necessary to resign from that position. There are not many who can so adequately fill the vacancy he makes.

CORRESPONDENCE.

To the Editor of VARSITY:

DEAR SIR,—In your report of Mr. S. H. Blake's address I find this sentence : "If the Presbyterian College at Kingston be aided (i.e. by the Ontario Government), a grant must be given to the Methodists, Baptists, Roman Catholics and Congregationalists, for their higher education." In the same issue of your paper Professor A. B. Macallum publishes an article containing this statement : "If Queen's gets provincial aid while remaining independent of provincial control, then eventually the University of Ottawa, McMaster University and the Western University must receive provincial aid."

Mr. Blake should have omitted "Baptists" from his list, and Professor Macallum should have omitted "McMaster University" from his list. Forty years ago, when our college in Woodstock was in sore straits, the new college building having been destroyed by fire, the town council passed a resolution to raise money to help the college by taxing the inhabitants of the town. This offer the Baptists of that day promptly declined, being unwilling, as they declared, to "make any compromise of the Baptist principles of voluntaryism." The principle of voluntaryism which distinguished the Baptists of that day is tenaciously held by their successors, and therefore they will never ask, nor would they accept, Government aid for their schools.

To the dangerous doctrine that a Christian denomination, if it can show that it is doing service for some of the people of a city, a province or a country, has a right to ask the Government of that city, province or country to give it financial aid the Baptists are consistently and unalterably opposed. McMaster University, in its Arts college, welcomes students of any denomination, and has had on its roll from time to time representatives of many denominations. It desires to do as great a service as possible for the young people of Ontario and of Canada. And in so far as our ideals are realized we believe that McMaster University is worth something to the province and the Dominion. But though we are doing a public service, McMaster University is the property and is under the control of a religious denomination, and therefore it has no right to receive from the Government of Ontario money which belongs to the people at large. Baptists, by a memorial, have protested in Ottawa against Government aid to denominational schools among the Indians of the North-West, and are giving emphasis to their protest by supporting Indian schools without such aid. And they are prepared to protest, on similar grounds, as they have done in the past, against granting to denominational schools of higher education money raised by taxation. It has become dangerously easy for the promoters of good causes to run to the common chest for money. All this makes Baptists feel that their mission in defence of the absolute separation of church and State and of the principle of voluntaryism is not yet wholly fulfilled.

O. C. S. WALLACE.

* REVERIE.

There are certail, moods of mind in which we long to steal away from the press of studies, with the activity of corridor and lecture room, to seek some quiet spot where we may indulge our reveries undisturbed. Beguiled into such a train of musing, owing to temporary cessation from work, I was led to meditate awhile the other night on the delightfully mystic yet suggestive topic of "The Hedonistic qualities of study."

Do the long hours of toil and close application bring no reward beyond the flecting and evanescent pleasures found in mere material success? Or is there a higher happiness for which the soul yearns, and whereby man may realize his truest ideal? Surely many a course of study might have been made lighter if there had been such a conviction to inspire, or such a goal for which to work.

Some landscape sketchers, it is said, can throw upon the canvas in one half hour a work as great and complete as they could have produced in a dozen years. Does the same thing apply in any measure to our conditions? Why bestow additional toil without additional effect? And then, too, if the B.A. degree can be obtained by a maximum of ease and a minimum of labor, are there not some to say that the result would be, from the economic point of view at least, an admirable one?

But even this method, insufficient as it may seem to be, presupposes at least some measure of success. There is yet that great army whom no man can number who have tried, have struggled bravely for a time, and then gone down to form stepping stones for others more fortunate than they. Alas! how many such have as the poet sings,

" Begun with gladness :

Whereof has come in the end despondency and sadness -."

Yet, in spite of all, the labor of study is not in vain. True knowledge is not acquired by the bold dashes of the sketcher's brush, nor through seeking some short-cut to prosperity and fame. And though there may be toil and disappointment in climbing the steep and narrow precipices at first, after that the way is broad and easy. Then,

" The labor we delight in physics pain."

And though the cost has been great the reward shall be infinitely greater. W. E. T. '01.

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IN MEMORIAM.

It was with deep regret that the students at the School learned on their return of the death of one of their number-Mr. G. C. McCollum, of the Mechanical and Electrical department of the Third year. Mr. McCollum was the eldest son of ex-Mayor J. R. McCollum, of Welland, Ont., and was twenty-two years of age. He took ill on Thursday, Dec. 20, and after two weeks of pain passed away at Toronto General Hospital on Friday, Jan. 4. The remains were taken to Welland for interment, which took place with military honors on Monday the 7th inst. Mr. McCollum was a lieutenant in the 44th

Mr. McCollum was a lieutenant in the 44th Welland regiment. He will be much missed by his associates of the Third year, as his cheerful disposition made him a general favorite.

AMONG OTHER COLLEGES.

The senior class of Lehigh University imposed a fee of ten dollars for the year.

There are eighteen Greek Letter Societies in connection with Cornell University.

The Yale Glee Club took a three weeks' trip from December 19th to January 13th.

The Alumni of Western New York held their first re-union at Buffalo, December 17th.

Yale finished the season \$10,000 ahead in football and with a surplus of \$3,000 in baseball.

There are complaints at Pennsylvania of a lack of the esprit de corps among the undergraduates.

The class of '86 at Princeton has presented the university with a golf club house to cost between \$15,000 and \$20,000.

The official registration figures at Yale as given in the catalogue recently issued show a total of 2,542 in attendance.

The revised plans for the projected University of California buildings have been accepted by the regents. They contemplate an expenditure of about \$10,000,000.

Pres. Schurman recently addressed the students of Ithaca on the matter of fraud in examinations and appealed to the students to co-operate with the Faculty in removing the evil.

The average age of the present freshman class at Yale is 19 years and two months—eight months more than the average age of new students at the New Haven institution for many years.

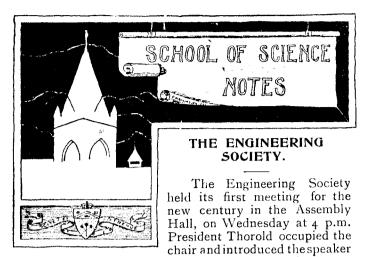
Chicago University has recently received \$1,500,000 from John D. Rockefeller, of which \$1,000,000 is for endowment and \$500,000 for general expenses. Mr. Leon Mandell has also given \$25,000.

Harvard and Yale held their annual debate in Cambridge last December. The question debated was the permanent retention of the Philippines. Harvard argued the affirmative and was unanimously given the decision.

The first year and a half of President Hadley's administration show a total of gifts to Yale University amounting to somewhat more than \$1,100,000. The Yale Library has gained 12,000 volumes during the year, and has now 265,000 volumes.

INTER-COLLEGE CLUB.

The Inter-college Club again extends a cordial invitation to all who are interested in its work to attend its meetings. The club meets weekly in the Y.M.C.A. parlor on Thursday evening from 8 o'clock to 10. At each meeting a discussion is held on the topic announced on the program, and this discussion is led by one or two of the members who have given special thought and preparation to the subject. This year the greater part of the subjects are of a social or political nature, broadly speaking, and the club has endeavored to choose primarily those questions which are timely and practical. . It is of great importance that the students of the various faculties of Arts, Medicine, Law, Theology, etc. come together to talk frankly and fearlessly over some of the problems of our own civilization and our own country, and it is hoped that during the Easter term many will avail themselves of the opportunity offered by the meetings of the Inter-college Club. All are welcome, students, graduates and outsiders. Anyone desiring to see the program will find it on the University bulletin board.



of the afternoon, Mr. J. A. Ardagh, a graduate of '93, who gave a paper on "Peat Fuel." Mr. Ardagh has been for some time closely identified with the manufacture of peat, and described in detail the most modern methods of harvesting, drying and compressing the article preparatory to its being put on the market. The paper was followed by some interesting discussion.

Professor Coleman deplored the short sighted policy that has depleted our forests of wood and made us dependent on other sources for fuel. His explorations had brought under his notice thousands of acres of peat bogs in the northern parts of our own province and Quebec which he regarded as one of the greatest resources of our country. He looked forward to the time when gas would be used as a means of heat for all domestic purposes.

Mr. Wilson Irwin described some of the appliances which have been lately installed by the Trent Valley Peat Fuel Company and other firms. Recent improvements in methods of drying and compressing have revolutionized peat manufacture, and lowered the cost. He described experiments which prove its excellent heating qualities.

Mr. Chace reported on behalf of the committee appointed to interview the executive of the University College Lit., anent the separation of the School from that society. A motion was carried to drop the matter.

NOTES.

Frank Perry, '99, spent his holidays in the city. He has charge of the alkali manufacture at the Soo.

Mr. Burnside fell on Monday last on the icy sidewalk, injuring his hip. We hope for him a speedy recovery.

A. B. Pickett, who started with the class of 'o1, and who was taken ill at the end of his first year, was round on Wednesday last renewing acquaintances.

R. J. Wilson, formerly of the '99 class, has returned to the School to finish his third year with '01. Rus. has been in the employ of the C.P.R. in Quebec for the past year.

Mr. Stewart was not lecturing on Wednesday. We were told by one of the faculty that he was away on important business, a new member having been added to the staff.

Those who view with alarm the exodus of Canadians to other lands, find consolation in the fact that the natural increase goes on apace. Mr. Blue will please tally one —this time, a D.L.S.

W. J. Fuller, formerly of the class of 'or, paid the third year a short visit on Monday last. Will. does not intend finishing his course as he has had to take charge of the business of his father, who died last spring.

The assertion by Mr. W. P. Ellis on the occasion of Mr. Kennedy's lecture at the Board of Trade on Thursday evening, that there were a dozen positions waiting each School of Science graduate, was greeted with hearty applause.

The First Year Hockey organization meeting was held on Thursday. Mr. James occupied the chair. Mr. Evans was elected captain, and Mr. Harcourt, manager for the coming season. We bespeak for the boys a most successful winter.

The following men were elected to fill the offices of the Hockey club: Hon. president, Dr. Ellis; president, E. V. Neelands; manager, J. A. Wheelihans; sec.-treas., F. C. Jackson; 4th year rep., S. M. Thorne; 3rd year rep., W. P. Brereton; 2nd year rep., Chas. Marrs; 1st year rep., Wilkie Evans.

During the holidays the floors of the School were covered by a layer of oil about one-eighth inch deep, making locomotion on them rather difficult. It appears that one of the faculty, not using the proper precautions, left his measure at the foot of one of the staircases, and has since been wearing other dry goods.

Some of our enterprising undergraduates are considering the advisability of establishing a journal to be edited by and devoted to the interests of School of Science students. It is thought that the composition and presswork could be done on the School premises. The idea is novel, and with the co-operation and zeal that the responsibility of the venture would inspire, would doubtless succeed. More anon.

We were pleased to welcome to our midst Mr. J. B. Heron, who returned from South Africa on Friday last. Mr. Heron, who was of the present second year of the School went with the Canadian Mounted Rifles about a year ago. Upon arriving at Cape Town his division went at once under the direct command of Lord Roberts, and was with him throughout the war. In all Mr. Heron was in about forty engagements, having been in all the fights leading up to the occupation of Johannesburg and Pretoria. We are pleased to know that he came through it all without a scratch, and was not in the hospital a day. Like many others he did not fall in love with the country, and thinks now that for the present at least the School is good enough.

The following is taken from the Rossland Weekly Miner of December 20th, 1900: "E. G. Woodford, mining and civil engineer, is in the city. Mr. Woodford has had a varied experience in mining and in the course of his professional career has visited a large portion of the world. He is evidently a man of more than average courage and has a high standing in his profession. Mr. Woodford was seen yesterday and said: "One night was put in the Yellowstone property where we were the guests of Mr. Herbert E. T. Haultain, manager of that property. I have been examining properties for companies for twenty years of my life and it was a genuine pleasure for me to meet a young mining engineer, who has located a mine, packed in a sawmill, and built up a mining proposition, with a mill dropping ten stamps that would serve as a model for any school of mines in the world. I have never seen anything better arranged than they are about this mine and mill. It is such a rare occurrence to meet a man who is capable of doing his work from A to Z. I do not know what the values of the ore of the Yellowstone are, but I presume they are not very high. If Canada, however, can produce many young men like the one in charge of the Yellowstone there is plenty of room for the employment of their talents in this large mining centre." Mr. Haultain graduated from the School in 1889.

SPORTS.

HOCKEY.

WELLINGTONS II. 9-VARSITY II. 5.

At the Mutual Street Rink on Thursday last the intermediate Wellingtons defeated Varsity II in a game which was remarkably fast and hard fought throughout, and not entirely devoid of roughness. The half time score was 4-2 in favor of the Wellingtons, and the final score stood 9-5. For the winners Lemaitre and McCord did especially well, while Pardoe, Caulfield and Gilfillan were easily the stars of the Varsity team. Pardoe's work in goal was nothing short of brilliant. Lang, although not completely recovered from illness did well at cover, and when in condition_should put up a much stronger game. The whole forward line were far too slow in getting away, and almost invariably held the puck too long, thereby losing many chances which should have resulted in scores.

Varsity's defeat was not entirely without its element of hard luck, for at times they outplayed their opponents at all points, and yet failed to score simply through slow and wretched shooting. Although 4 goals behind, Varsity with a strengthened team should make a much better showing when the return game is played on Thursday next. Profiting by the experience of Thursday last, there is no reason why the boys should not finally win out. The forwards should try to follow back a little faster, and besides, a number of scores resulted from the Wellington centres being left entirely uncovered in front of goal. This, however, may be easily remedied. The Varsity team all through played good, fast

The Varsity team all through played good, fast hockey, and save in their inability to shoot, were quite as good a team as their opponents, and in fact completely outplayed them at times. However, the score stood 9-5 against them, and we can only hope for better things next time.

The play was as follows:—Varsity took possession of the puck at the start and rushed, but Pringle relieved. Lemaitre and McCord each lost easy chances to score for Wellingtons, and after about five minutes play Caulfield, on a neat pass from Biggs, scored first goal for Varsity. When play was resumed, Pardoe demonstrated his ability as a goalkeeper by clearing in beautiful style a fusilade of hot shots. Following up very fast Gilfillan intercepted a lift and notched No. 2 for Varsity. Wellingtons now took a hand in the scoring and secured the next three goals. The hot pace set at the start now began to tell on the players and the play became listless. On a pass from Morrison, McCord tallied once more and this ended the scoring in the first half. The bell rang with the Wellingtons leading. Score 4—2.

McCord opened the second half by scoring No. 7 for Wellingtons and the play became rough. Lemaitre was given a rest for cross checking but returned before another score. Sweatman secured No. 8 for Wellingtons after a pretty combination rush. Varsity now worked up and scored the next two, Caulfield and Gilfillan doing the needful. Wellingtons scored two more when Lang and McCord became mixed and by request of Referee Taylor decorated the fence for a brief three minutes. Lemaitre notched the last goal for the Wellingtons and O'Flyn finished the scoring by tallying for Varsity. Final score 9–5.

THE TEAMS.

Wellingtons II.—Goal, Ardagh; point, Pringle; cover, Morrison; forwards, Lemaitre, McCord, Lambe and Sweatman. Varsity II.—Goal, Pardoe; point, Boyd; cover, Lang; forwards, O'Flynn, Biggs, Gilfillan and Caulfield.

GAMES THIS WEEK.

O. 11. A.

Thursday, 8 p.m.—Varsity II. vs. Wellingtons II. Friday, 8 p.m.—Varsity I. vs. Wellingtons I.

JENNINGS' CUP SERIES.

Tuesday, 5 p.m.-Senior S.P.S. vs. Senior Meds.

Thursday, 3 p.m.—'01 vs. '02.

Saturday, 2 p.m.—Dentals vs. Junior S.P.S.

Unusual interest is being taken in the Jennings' cup series this year and gives great promise of developing some very fast hockey. With S.P.S. and Meds. divided and McMaster in the series, we may expect to see games quite up to Senior O. H. A. standard. Although too early to judge of their strength, a glance at the prospective teams might not be uninteresting. At present the Junior S.P.S. appears to be the strongest, and with Pardoe, Melden und Evans on the defence should not have any very great difficulty in retaining the cup won by their predecessors. The Junior Meds. ought to make a good showing with Gilbert on the defence and Caulfield, Biggs and White of last year's '03 team on the forward line. Of the Arts' teams 'or at the present stage of the game seem to be the strongest and with "Bill" Hanley in goal and Brown at point ought to be able to win their series. The Dents., too, are said to be strong with Gibson, Gilfillan and Peaker of last year's team back and any amount of promising material in the Freshman class. McMaster and Victoria are both said to be strong, and altogether we may look forward to a season of keen contests and who knows what "stars" may be developed to fill the vacancies in Varsity's Senior and Intermediate teams of next year.

LECTURE BY A. T. DELURY.

The second lecture of the course arranged by the various societies for Easter term was given yesterday afternoon by Mr. DeLury, the subject being, "Newton----His Life and Work."

An account of Newton's somewhat uneventful life was first presented, particular prominence being given to those periods in which his creative genius was most active. The relation of Newton to other workers in the field of science of the preceding age as well as of his own was next described, and the special merit of his work pointed out. The lecturer outlined his achievements in the domain of optics, mechanics, astronomy, and pure mathematics, referring in particular to the law of gravitation, and the immortal principle in which this law was established. Lagrange, Laplace, and others competent to judge in such matters, were quoted to show the esteem in which Newton's work has been, and must continue to be held.

There should be a large turn-out to-night to cheer on our representatives in the inter-collegiate debate with McMaster.

CÆSARINE.

She came, she saw, she conquered, But I was not her foe. I came, I saw, *was* conquered, And now I am her beau.

ROTUNDA.

Superintending Editor, A. E. Hamilton, '02.

Dr. Milligan's sermon to the students will be delivered next Sunday at 3.30 p.m.

The Chess Club has to thank Prof. Mavor for the very pleasant evening spent at his house recently.

B. (confidentially to lady friend)—" I always show my disapproval of cosy corners by sitting on them."

Professor (observing student chewing gum)-Quid est hoc?

Student-Hoc est quid.

The many friends of Miss Jessie Fraser, '02, will be sorry to learn that she has had to give up any idea of continuing her course at the University.

When you induce your friends to attend the Undergraduate Union concert on February 1st, you do them a favor. Short is the time and sharp is the word !

We are glad to see D. G. Campbell, 01, back again after his trip through the Old Country. You should see him smile when "Hieland Lassies" are mentioned.

J. G. Inkster, '98, protests that he is not dead yet, notwithstanding defamatory reports to the contrary. Not even Scotch mists or Scotch theology can down Jock.

We are disappointed at learning that the part Mr. G. A. Hackney, 01, took in that matrimonial celebration during the holidays was only as best man. Better luck next time, George!

Some thief or thieves broke into Miss McMicking's book-case in the conversation room at the library, the first week of term, and took about five dollars worth of books, mainly those on the curriculum for the second year.

Brophey—" The scrutineer collected the ballots while I was talking, and neglected to ask me for mine. May I put it in now? Mr. Fisher will take his oath that this is my only ballot, if my own word is not good enough." Chairman John—" Your word is all right, Mr. B., but your action is too tardy."

The first year Latin class had a hard nut to crack the other day. The professor stated that a lasting quality should be indicated by the ablative, otherwise by the genitive. He then asked for the translation of "a girl of beauty." It was decided that if the young lady were a freshette the ablative would be the proper case.

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At a recent meeting of the first year men the constitution of the '04 Debating Society, which was drawn up by a special committee, was passed. Meetings will be held fortnightly, which will take the form of debate and mock parliament alternately. The following have been elected officers of the Society :—Pres., Haslam; 1st vice-pres., McGregor; 2nd vice-pres., Black; sec.-treas., Ballard; party leaders, Montague and Perry; speaker, Coleman; sergeant-at-arms, Williman.

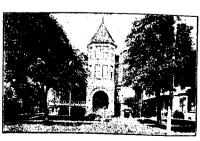
> My little love, do you remember, Ere we were grown so sadly wise, Those evenings in the bleak December, Curtained warm from the snowy weather, When you and I played chess together, Checkmated by each others' eyes?

—Eх.

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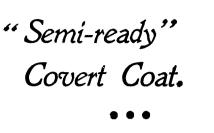
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ATTENTION

McGregor, '94 (debating): "A good, practical man may gain election to Parliament, though he is educated."

John J. Gibson, 'oo, who was taking post-graduate work before Christmas, has accepted a position in the office of the Canadian Manufacturers' Association.

"You ought to see 'o2's hockey team--McDiarmid and Cranston and I and I and Cranston and McDiarmid ! Cranston plays both wings."-F. N. B. Freddie and Mac will probably cover the Five Points.

Arthur Cohen, '02, returned to the city on the twelfth after spending a number of weeks in London, Paris, Berlin, Hanover, and Brussels. The storm he encount. ered on the trip back was the worst in the captain's experience, of course, but as Arthur took his sea legs along it did not bother him.

The Varsity Girl's Hockey Club have already made a selection from the numerous applicants for the positions of mascot and coach. Messrs. R- and H- being the lucky men. Applications for referee will be received by the Secretary until to-morrow, and the name of the favored man will be published in THE VARSITY next week.

The subject of the Varsity-McGill debate, to be held in Montreal on February 2nd, is: "Resolved, That it is in the best interests of the United States to hold possessions beyond the mainland of North America." Varsity, represented by Messrs. Fisher and Wilcox, has the affirmative, while Messrs. Irving and Fox will support the negative for "old McGill."

THE ROYAL MILITARY COLLEGE.

There are few national institutions of more value and interest to the country than the Royal Military College at Kingston. At the same time its object and the work it is accomplishing are not sufficiently understood by the general public.

Work it is accomptishing are not sumicrently indecided by the general public. The College is a Government institution, designed primarily for the purpose of giving the highest technical instructions in all branches of military science to cadets and officers of Canadian Militia. In fact it is intended to take the place in Canada of the English Woolwich and Sandhurst and the American West Point.

The Commandant and military instructors are all officers on the active list of the Imperial army, lent for the purpose, and in addition there is a complete staff of pro-fessors for the civil subjects which form such a large proportion of the College course.

Whilst the College is organized on a strictly military basis the cadets receive in addition to their military studies a thoroughly practical, scientific and sound training in all subjects that are essential to a high and general modern education.

The course in mathematics is very complete and a thorough grounding is given in the subjects of Civil Engineering, Civil and Hydrographic Surveying, Physics Chemistry, French and English.

The object of the College course is thus to give the cadets a training which shall thoroughly equip them for either a military or civil career. The strict discipline maintained at the College is one of the most valuable fea-tures of the system. As a result of it young men acquire habits of obedience and self-control and consequently of self-reliance and command, as well as experience in controlling and handing their fellows.

In addition the constant practice of gymnastics, drills and outdoor exercises of all kinds, ensures good health and fine physical condition.

An experienced medical officer is in attendance at the College daily.

Five commissions in the Imperial regular army are annually awarded as prizes to the cadets.

The length of course is three years, in three terms of 9½ months' residence each. The total cost of the three years' course, including board, uniforms, instructional material, and all extras, is from \$750 to \$800.

The annual competitive examination for admission to the College will take place at the headquarters of the several military districts in which candidates reside, in May of each year.

For full particulars of this examination or for any other information, application should be made as soon as possible, to the Adjutant General of Militia, Ottawa, Ont.

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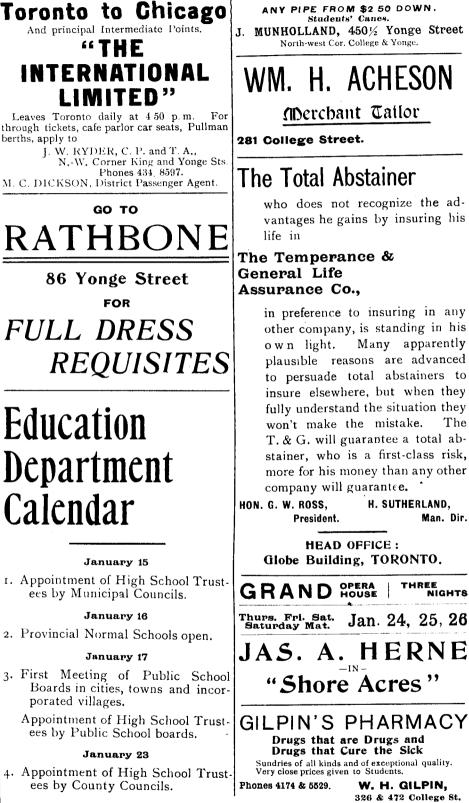
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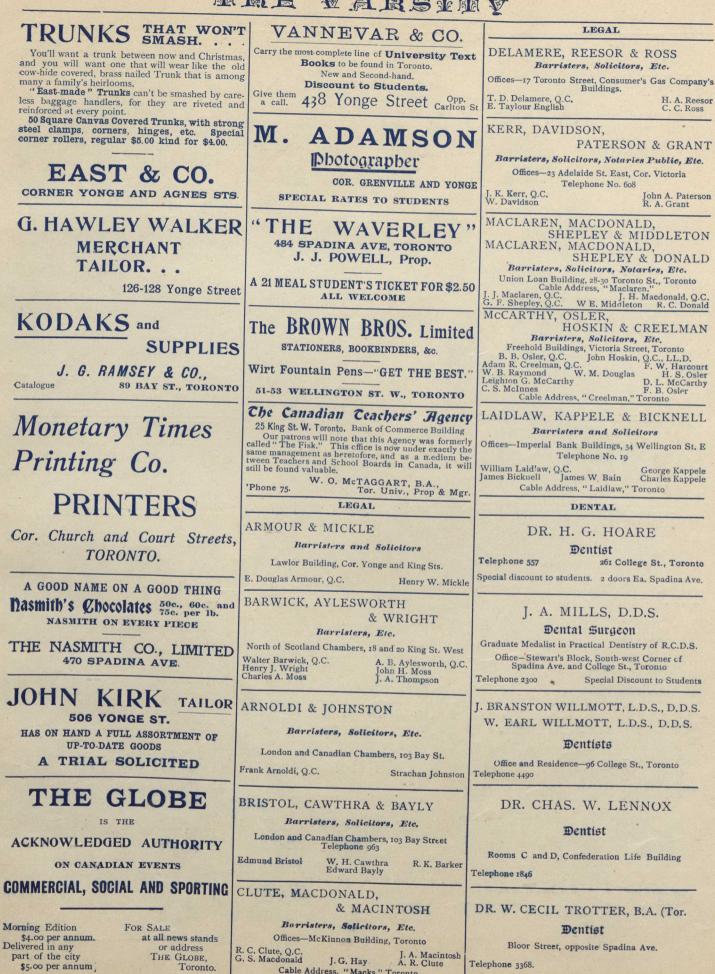
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