

jected to starvation is the constant diminution of weight. I have made many experiments on this loss, comparing animals of various sizes, and have determined that the function of dehydration—or reduction of weight—is in direct relation with the size of the animal; and I believe that I can deduce a great rule of comparative physiology that the activity and intensity of all the functions are determined by size. Carnivorous animals appear to bear fasting better than herbivorous kinds. The latter eat nearly all the time, and are ill when they have to stop; but carnivorous animals, in the wild state, are often forced to endure abstinences of considerable length; and a fast of several days is almost a physiological condition with them. When we examine the phases of the loss of weight of a starving animal, we find that it loses much during the first days. Then a moderate drain sets in. Again, in the last days considerable loss takes place, and this is the fore-runner of death. Cold-blooded animals can support inanition during a prodigiously long time. M. Vaillant has told me of a python weighing seventy kilogrammes that lived twenty-three months without eating; M. Collin, of a rattlesnake that lived twenty-nine months. Redi mentions a tortoise that lived eighteen months, and a frog sixteen months, without food. When we have frogs in our aquariums waiting to be experimented upon, we never feed them and they never starve. Dogs can endure an abstinence, on the average, of thirty days; cold-blooded animals, twice as long. They are capable of this, because their tissues are consumed more slowly, and do not require so frequent renewing. With both classes the fatal limit is reached when the loss of weight amounts to 40 per cent. This point is reached by the warm-blooded animal ten times as quickly as by the cold-blooded one, because its nervous system is ten times as active. The relation of the nervous system to the intensity of the chemical exchanges of vital action is shown by the existence of hibernating animals, or warm-blooded animals which periodically become cold-blooded. Becoming torpid at the approach of the cold season, their breathing and circulation become slow, their motions weaker, their eyelids close, they fall into their winter sleep, and their temperature descends to about 40° Fahr. The nervous system is the great inciter of nutrition; when it is vigorous or excited, the digestion is active, the breathing rapid, and the temperature high; and the loss of weight and the possible duration of abstinence follow the same rule. Man is subject to the same conditions in case of fasting or starvation as warm-blooded animals; and the influences of size, age, and nervous constitution are similar upon him. This is illustrated, in respect to age, in the legend of the family of Ugolin, in which the youngest child died first, at eight years of age, and the other children followed, while the father did not die till three or four days after the death of the last of them. So, in the wreck of the Medusa, the children died first on the raft, the old men next, and the adults last. The duration of the possible fast is considerably influenced by fever. That is supposed to determine the production of poisons which stimulate the nervous system and intensify the process of denutrition; so that under its influence, as has been observed in experiments on animals and in man, the weight diminishes more rapidly than under starvation alone. The influence of drinking is also noticeable. Of two dogs observed by M. Laborde, one died in twenty days; the other, which could drink at will, was still living at the end of thirty-seven days. There are also examples on the other side. Falck's dog went sixty-one days without drinking or eating. Starving dogs usually drink but little, as if warned by instinct not to drink more than they have to. Water, in fact, expedites the wasting of the tissues and accelerates the drain of the salts in the organism. Hence, by drinking, we excrete more chloride of sodium, phosphates, urea, etc., so that, although in general animals deprived of water do not live as long as those which can drink, there is some difference between those which can drink a little and those which can drink a great deal. The last die sooner. There is always less suffering when it is possible to drink; for it is a characteristic of privation that thirst torments more than hunger, and those who have told of what they have suffered on such occasions have usually emphasized this fact. But I do not believe that the hour of death is much delayed by the ingestion of drinks.—*M. Charles Richet, in the Revue Scientifique. Translated in Popular Science Monthly for February.*

PROFESSOR VOGEL, the German astronomer, has recently made an interesting demonstration of the existence of a companion to the big variable star Algol from photographs of the star's spectrum. Algol is one hundred and thirty-four times as large as the earth, but suffers a partial eclipse at short and regular intervals, when it loses about five-sixths of its brilliancy and falls from a star of the second magnitude to one of the fourth magnitude. Professor Vogel demonstrates by photographs of its spectra what was before suspected, that Algol has a dark satellite a hundred times as large as the earth, and moving at a speed of fifty-six miles per second, the interposition of which between us and the big star perfectly accounts for its remarkable variations.—*New York Herald.*

THE Russian Government has in contemplation a project for connecting, by a system of canals, the White Sea with Lake Onega and with the principal navigable rivers of Russia. The canals are to be of sufficient depth to admit vessels drawing ten feet of water.

READINGS FROM CURRENT LITERATURE.

LETTERS FROM MR. GLADSTONE.

MR. GLADSTONE, in acknowledging the receipt of a copy of Mr. R. Barry O'Brien's "Home Ruler's Manual," writes:—

"Your former works give me every confidence in your ability, and a glance at the volume you have so kindly sent me impresses me with the belief that it is well calculated to gain the adhesion of moderate men."

AN amateur lady artist sent as her birthday present to Mr. Gladstone a sketch of the veteran statesman sitting on a log of a tree which he had just felled, with Ariel, clothed as a female spirit, hovering over him. Mr. Gladstone sent the following acknowledgment:—

"Dear Madam,—Many thanks for your most pleasing drawing. I had always considered Ariel as masculine, but probably you are right.—Yours faithfully and obediently,
"W. E. GLADSTONE."

"VAS MARRIAGE A FAILURE?"

Vas marriage a failure? Vell, now, dot depends Altogedder on how you look at id, mine friends, Like those double-horse teams dot you see at der races, Id depends pooty mooch on der pair in der traces; Eef dhey don'd pull togedder right off at der start, Ten dimes outd of nine dhey vas beddher apart.

Vas marriage a failure? Der vote vas in doubt; Dthose dot's outd would be in, dthose dot's in would be outd; Der man mit exberience, good looks, und dash, Gets a vife mit some life hundred dousand in cash; Budt, after der honeymoon, vhere vas de honey? She haf der exberience—he haf der money.

Vas marriage a failure? Eef dot vas der case, Vot vas to become off der whole human race? Vot you dink dot der oldt "Pilgrim Faders" would say, Dot came in der Sunflower to oldt Plymouth Bay, To see der fine coundry dis peoples haf got, Und then here dhen ask sooch conundrums as dot?

Vas marriage a failure? Shust go, ere you tell, To dot Bunker Men Hillument, vhere Varren fell; Dink off Vashington, Franklin, und "Honest Old Abe"—Dhey vhas all ben around since dot first Plymouth babe. I vas only a Deutscher, but I dells you vot! I pelief every dime in sooch "failures" as dot.

Vas marriage a failure? I ask mine Katrine, Und she look off me so dot I feels pooty mean. Dhen she say: "Mr. Strauss, shust come here, eef you bleaze."

Und she dake me vhere Yawcob und leedle Loweeze By dher shnug trundle-bed vast shust saying dtheir brayer, Und she say, mit a smile: "Vas der some failures dhere?"

—*Yawcob Strauss, in the Pilot.*

THE MILLIONAIRE AS THE POPULAR IDEAL.

Not only do we not specially decry American millionaires, but we think their quality of mammoths the most redeeming feature in the worship paid them. Money in those huge aggregates has in it such potentialities, is so entirely beyond what any man can spend upon self-indulgence, that we can understand that the desire for it is often another form of the vague desire for power which stirs the hearts not only of the ambitious but of the philanthropic. It is not the millionaire, but the millionaire as the popular ideal, who arouses our apprehensions. Men desire money in Europe, and sometimes, when they have anything to get, worship millionaires; but they do not make of them ideals. . . . Not even in France are the millionaires raised into ideals, while in Germany they are loathed; in Italy, where men quit business on £200 a year, they are disregarded; in Austria they are nothing, being crushed by the reverence for birth; and in England they are—what shall I say? defended, with apologies for the defence, as people who are useful in their way. That the admiration for wealth—mere wealth—grows here in all European countries, we do not deny, because all other forms of irresponsible power are dying, and men long for power less fettered than the power derived from a popular vote; but we are far, as yet, from what *The Nation* declares to be the American position. Let us hope that it exaggerates, though so many symptoms seem to confirm its words; but if it does not, then the republic which should be ahead of all is rushing faster than the monarchies along a path which leads only to the degradation of the race. Better any deity than Belial, if man is to advance, even if it be so absurd an one as is embodied in the English conception of aristocracy. That does, at least, impose some obligations.—*The Spectator.*

In a recent speech, Mr. Gladstone, after referring to his excellent health, said that his friend and doctor, Sir Andrew Clark, of London, when he wanted to describe Mr. Gladstone's state of health in the most glowing terms, told him that his constitution was almost as good as his wife's. It appears that Mrs. Gladstone's extraordinary energy is like that of her husband, and increases with years. She has never taken a more active part in public affairs than since she passed her seventy-fifth birthday. Probably history has nothing to equal the marvellous combination of health, vitality and the increasing activity possessed by this aged and remarkable couple.

The Western Canada Loan and Savings Company.

THE Annual Meeting of this Company was held at its offices, No. 75 Church Street, Toronto, on Saturday, 15th February, 1890. A number of shareholders were present. The Hon. Speaker Allan occupied the chair, and the Managing Director, Mr. Walter S. Lee, acted as secretary to the meeting. The following financial statements were read, and with the Directors' Report were unanimously approved of, and passed on motion of the President, seconded by Sir David Macpherson, K.C.M.G.

TWENTY-SEVENTH ANNUAL REPORT OF THE DIRECTORS.

The Directors beg to submit to the shareholders the twenty-seventh Annual Report of the Company's affairs.

The profits of the year, after deducting all charges, amount to \$175,163.66, out of which have been paid two half-yearly dividends at the rate of ten per cent. per annum, amounting, together with the income tax thereon, to \$141,885. The balance remaining, \$33,278.66, has been carried to the contingent account.

The amount loaned on mortgage during the year is \$1,224,811, and there has been paid back by borrowers, \$1,231,550. The repayments on loans during the year, both in Ontario and Manitoba, have been satisfactorily met, and afford the best evidence that the money of the Company has been carefully and judiciously invested.

Out of \$570,000 of the Company's debentures, bearing 4½ and 5 per cent., which matured during the year, a large proportion was renewed, all at the rate of 4 per cent. per annum, making the new debentures issued at the latter rate, a total at the end of the year of \$3,132,610.00, an increase of \$247,324.00.

The continuous demand for the Company's debentures by investors in Great Britain and Canada rendered it necessary to provide for an extension of the borrowing powers of the Company, and it was considered desirable to meet this by increasing the paid-up capital stock.

The Directors therefore called in 5 per cent. of the subscribed capital, payable on the 15th of December last.

The call was promptly met by the shareholders, and the proceeds \$100,000, was added to the paid-up capital stock, making the total amount of paid-up capital stock \$1,500,000. The proportion of premium on the amount paid up was \$50,000, which was carried to the Reserve Fund.

The Balance Sheet and Profit and Loss Account, together with the Auditors' Report, are submitted herewith.

G. W. ALLAN, President.

FINANCIAL STATEMENT FOR THE YEAR ENDING 31st DEC., 1889. LIABILITIES AND ASSETS.

LIABILITIES.	
To the Shareholders.	
Capital stock	\$1,500,000 00
Reserve fund	750,000 00
Contingent account	101,644 24
Dividend payable 8th January, 1890	70,000 00
	\$2,421,644 24

To the Public.	
Debentures and interest	\$3,171,845 22
Deposits and interest	1,179,118 46
Sundry accounts	4,350,963 68
	\$890 30
	\$6,773,488 22

ASSETS.	
Investments	6,570,652 52
Office premises—Winnipeg and Toronto	120,759 92
Cash on hand and in banks	81,923 68
Sundry accounts	148 70
	\$6,773,488 22

PROFIT AND LOSS ACCOUNT.	
Cost of management, viz.:—Salaries, rent, inspection and valuation, office expenses, branch office, etc.	\$40,569 57
Directors' compensation	3,780 00
Interest on deposits	47,672 58
Interest on debentures	129,783 50
Agents' commissions on loans and debentures	14,663 29
Net profit for year applied as follows:	
Dividends and tax thereon	\$141,885 00
Carried to contingent account	33,278 66
	175,163 66

	\$411,632 60
Interest on mortgages, debentures, rents, etc.	\$411,632 60
	\$411,632 60

WALTER S. LEE, Managing Director.

February 5th, 1890.

To the Shareholders of the Western Canada Loan and Savings Company:

GENTLEMEN,—We beg to report that we have completed our audit of the books of the Western Canada Loan and Savings Company for the year ending on the 31st December, 1889, and certify that the above statements of assets and liabilities and profit and loss are correct, and show the true position of the Company's affairs.

Every mortgage and debenture or other security, with the exception of those of the Manitoba Branch, which have been inspected by a special officer, have been compared with the books of the Company. They are correct and correspond in all respects with the schedules and ledgers. The bank balances are certified as correct.

W. R. HARRIS,
FRED. J. MENET, } Auditors.

The President then said:

I have now to perform my customary part, as President, of moving the adoption of the report which you have just heard read. My only difficulty in doing so is one which perhaps the Shareholders will readily condone, and that is, that I have very little that is new to say, beyond what it has been my pleasant duty to say to you for many annual meetings, that the Western Canada continues to maintain the high position which it has so long held, both here and in Great Britain, as one of the safest and soundest among our monetary institutions. In confirmation of this, and especially as to the standing of the Company in Great Britain, we can point not only to the ready sales which our bonds find among investors there, and the large amount referred to in the report which have been renewed at four per cent. interest, but also to the significant fact that a very large number of our bonds are taken by trustees and others, with whom the assurance of perfect safety in their investments weighs more than any other consideration.

In connection with this subject I may allude to that paragraph in the report which states that, finding it necessary to provide for an extension of our borrowing powers, the Directors deemed it desirable to increase the paid-up capital stock of the Company. The promptness with which the call was met showed that our shareholders had undiminished confidence in the present standing and future prospects of the Company. And the point to which I would call your attention is the repayments on our loans, which continue to be very satisfactory, and I think I may venture to say that no company loaning money exercises more scrupulous care to ascertain not only the cash value, and the capabilities of the properties offered in security, as well as the character and standing of the borrower. It would in many instances have been easier to obtain higher rates of interest had the Director been willing to accept certain classes of security which, though the present values might seem to afford a fair margin, were of doubtful stability in the future, but they have not deemed this either a safe or wise policy to pursue, and I venture to think that the course which they have preferred to follow will have your full approval.

In connection with this subject you will be glad, I am sure, to know that, in addition to our old and tried agents in Ontario, we are most fortunate in possessing a most excellent class of appraisers in Manitoba, men of high character and good standing, and possessing a thorough knowledge of the districts for which they are acting.

I do not think I have any more to add except that both here in our Head Office and in the Manitoba Branch the Company continues to be most efficiently served by an able and thoroughly capable office staff, and the Directors are glad to have this opportunity of acknowledging the value of their services.

Messrs. Henry Pellatt and A. G. Lee were appointed scrutineers, and the retiring Directors, the Hon. G. W. Allan, Thos. H. Lee, Esq., and the Hon. Sir David Macpherson, K.C.M.G., were re-elected. These gentlemen, with Messrs. George Gooderham, Geo. W. Lewis, Alfred Gooderham and Walter S. Lee, form the full Board.

At a meeting of the Directors held subsequently, the Hon. G. W. Allan and George Gooderham, Esq., were respectively re-elected President and Vice-President.