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of its dominating position, and because the Indian tribes of the North and Northwest could be wielded from that position for the intimidation of the provinces southward on the Atlantic border, it was seen at once that as Canada had become the key of the new political and military strategy of Great Britain for purposes of offence, so Canada must be made the key of political and military strategy in the hands of the early Revolutionary leaders for purposes of defence. So clear was this position of Canada, whether for purposes of offence or defence at this juncture, that we find Dr. Samuel Johnson hinting with a caustic sneer in his Tory pamphlet of 1775, 'Taxation no Tyranny,' that the British Ministry might see the refractious colonists brought "at their feet" by restoring Canada to the French (that the colonists "might have an enemy so near them"), and by "encouraging the Indians now and then to plunder a plantation." He recognized this caustic proposal to be a "wild" one, but it was, he said, no wilder than the idea that Americans should not be governed and taxed for Great Britain's benefit, after Great Britain had fought and conquered for their safety from French domination in Canada.

On the 22d of October, 1775, we find Richard Henry Lee writing to Gen. Washington: "Before this reaches you, you will have heard of Col. Allen's unlucky attempt upon Montreal, nor have we from the last accounts much prospect of success from St. John's. The ministerial dependence on Canada is so great that no object can be of greater importance to North America than to defeat them there. It appears to me that we must have that country with us this winter, cost what it will." And a few days later, October 26, 1775, we find Gen. Washington writing to Gen. Schuyler, as he was moving to the support of Gen. Montgomery: "The more I reflect upon the importance of your expedition, the greater is my concern lest it should sink under insuperable difficulties. I look upon the interests and salvation of our bleeding country, in a great degree, to depend upon your success." Moreover, the conquest of Canada was deemed essential to protect the natural right of the New England colonies to the fisheries in the Northeast—a right which had to be protected by stipulation in the Treaty of Peace of 1783, after it had failed to be protected by right of conquest in the Revolutionary war.

How all these strategic and economic reasons in favor of the conquest of Canada were intensified by the passage of the Quebec Bill (a bill which had for its object, as the Continental Congress charged, to substitute the institutes of French customary law for the common law of England, and thereby "to make Canadians proper instruments for assisting in the oppression of such as differ from them in modes of government and faith"), is matter of too common knowledge to call for more than mention. Just as little need we more than mention the difficult and ambiguous rôle which the Revolutionary agitators were called to play when, in their addresses to the people of Canada, they invited friendly coöperation, while in their Address to the people of England they inveighed against the Quebec Bill because, in reëstablishing the Roman Catholic religion in its ancient rights, that bill, they said, had reëstablished a religion "fraught with sanguinary and impious tenets." That the Roman Catholics of Canada could not contain their resentment, and broke out in curses on what they called "a perfidious and double-faced Congress," when they read this address in the translations distributed among them, we may see in the letters of that day (Force's Archives, vol. ii., p. 231). John Brown was far from being always over-sanguine in his reports, whatever he might write to Gov. Trumbull or others. He wrote to the Boston Committee of Correspondence on the 29th of March, 1775, that there was "no prospect of Canada's sending delegates to the Continental Congress." We know from the minutes of the Continental Congress that others than John Brown brought reports from Canada direct to that body. How little John Brown had to do with procuring or even precipitating the campaign against Canada in 1775 and 1776 might have been inferred from the fact that the Continental Congress revived the whole project of "the emancipation of Canada" in 1779, discussed at length with Gen. Washington (through a select committee raised for the purpose) the military combinations which might then be deemed essential to that end, and abandoned the enterprise only with great reluctance, while still pledging themselves to "embrace with alacrity every favorable incident which should facilitate and hasten the freedom and independence of Canada, and her union with these States."

Prof. Egleston gives a whole chapter to the history of Shays's Rebellion and of the part which Gen. Paterson took in its suppression. We entirely concur with the author in holding that the conduct of Paterson was not blameworthy because at one time, in the course of his operations, he promised some of the insurgents that if they would disperse they might remain peaceably at their homes, and, if tried at all, should be tried in their own counties. Gen. Lincoln, the commander-in-chief of the State militia, had promised as much to certain insurgents whom he had paroled, and this proceeding of his was subsequently approved by the State Legislature. Perhaps Gen. Paterson, in the reaction which followed the rebellion, was blamed because he had not lived up to a threat contained in a postscript to one of his letters addressed to Gen. Lincoln from Lanesborough, in which, under date of February 5, 1787, he had said that if he should judge it practicable to attack the insurgents in Berkshire County with a probability of success, he would not "wait the determination of the General Court that they are in a state of rebellion, but would consider them as such and act accordingly." By thundering so loud in the index, he made it a little difficult for himself to defend his lenity, and to show the consistency with which he had practised it on "rebels" who, without his knowing it, had been formally declared such just one day before he launched this menace at them in the despatch to his commander.

We may say, in closing, that Gen. Paterson in one of his letters during the Shays Rebellion uses a word which is new to us. Writing about what seemed to him a better political outlook in the early part of 1787, he says: "I most sincerely congratulate you on the happy prospects which are before us in the *aristocration* of legal and constitutional government." The biographer, too, takes liberty with both history and philology when, in describing the sufferings of our troops in Canada from smallpox in 1776, he uses the word "vaccination" as convertible in meaning and currency with the word "inoculation."

The Animal as a Machine and a Prime Motor, and the Laws of Energetics. By R. H. Thurston. John Wiley & Sons. 1894.

In this little book Prof. Thurston pursues that way of attacking the Second Law of Thermodynamics (or, as he prefers to call it, the Law of Carnot) which is his own. That law is that heat flows from hot bodies to cold, as water runs down hill; so that when bodies are all cooled down to one level of temperature, the heat in them above the absolute zero is no more available to run an engine than is the height of the sea above the centre of the earth available to turn a water-wheel. At one time great ingenuity was expended to discover some exception to the Second Law of Thermodynamics; but the only exception which withstood examination was the hypothesis of Maxwell. Maxwell supposed a diaphragm in a vessel to separate two portions of air; and that in this diaphragm was a little sliding door at which should sit a tiny doorkeeper who should look out for the very fast-moving molecules coming one way and for the very slow-moving ones coming the other way, and open the door for these and for no others. In that way the air on one side would become heated, and that on the other side cooled. It was the first time an advantageous route for science had been found through fairy-land; and when it was further remarked that, by replacing the little door by a lobby with two doors and putting a fan-wheel in the lobby, an engine could be run directly, the analogy to the running of a water-wheel by the gravitational energy of the ocean became striking. Prof. Thurston considers our inability to use the great heat above the absolute zero of ordinary objects to be a shocking waste; and one of the chief purposes of this little book is to adduce evidence that living animals are machines in which the Second Law of Thermodynamics is "evaded." Inasmuch as he says the Law of Carnot "asserts the necessity of waste," and further says this waste does not take place in the living machinery, perhaps "violated" would have been a clearer word than "evaded."

Prof. Thurston certainly succeeds in showing that, accepting extant experiments upon animals (and they are both elaborate and numerous) for what they may be worth, they distinctly point towards some violation of accepted laws of energy. Thus the careful experiments of Hirn showed that more heat by a third part was generated by the human body than the combustion of food would account for. Moreover, when Hirn compared the amount of work a man performed with the reduction of the heat generated while he was at work below what was generated at the same time while he was at rest, he obtained a result which Prof. Thurston argues is contrary to accepted laws of thermodynamics. "The animal system," he says, speaking of it as a motor, "conceals some secrets that science has still to discover." Dr. Pavy's well-known experiment on two pedestrians is also cited to show that "the body as a heat engine is capable, apparently, of performing more work than the food would seem competent to do." Dr. Austin Flint failed to explain from known physical principles the results of his experiments upon the pedestrian Weston in a walk of 310 miles.

Prof. Thurston's conclusion is, not that there is any inaccuracy in the law of the conservation of energy, which rests with him upon metaphysical grounds, but that the Law of Carnot is somehow "evaded." If the mechanical conception of the universe, that all that exists is expressible in terms of mass, space, and time, upon which Helmholtz rested his celebrated enunciation, be accepted, it is known that the "Law of Carnot" follows as a corollary. By the majority of physicists the alternative will be felt to be either, on the one hand, to suppose that all the observations that have been made upon animals are subject to a common error, due to the same cause, whatever that may be; or, accepting the experimental evidence, to conclude that the law of the conservation of energy is not exactly fulfilled in living animal bodies. The Law of Carnot was enunciated long before the law of the conservation of energy, and, if it be regarded as the assertion that the average motions of the different parts of a system tend to equalize themselves or to approach final ratios, is incontestably quite as certain as the law of energy.

Prof. Langley has recently taught us how one of the great wonders of the animal world—that of the soaring bird—is performed. Now, if we are to take his successful explanation as a model by which to explain other animal marvels, it must be confessed that the way the bird turns this way or that way to take advantage of the lulls and puffs of the wind, is not unlike the opening and shutting of the doors of Maxwell's devils, thus affording some comfort to Prof. Thurston. The book has, at any rate, the merit of calling attention to one of those residual unexplained phenomena in the patient study of which, not in blind denial of them, the progress of science consists.

Crumbling Idols. By Hamlin Garland. Chicago and Cambridge: Stone & Kimball.

In these twelve essays, dealing with art, literature, "and the drama," Mr. Garland recites his credo to whosoever will listen. Its articles have two broad divisions—the renunciation of the past and all its works, and the belief in what is to come out of "the mighty spaces of the West" and its "swarming millions of young men and women." Veritism is the name in which devils are to be cast out, and the artist himself is to be a veritist, to whom the "satyriasic French novelist" will be anathema maranatha no less than the "blind fetishism, timid provincialism, or commercial greed which puts the work of" the masters "above the living, breathing artist." Shakspere, in fact, "lies, sunk and sinking, just as every other human soul sinks into the sand." And, again, "Shakspere, Wordsworth, Dante, Milton, are fading away into mere names—books we should read but seldom do." Yet their spirits have not departed into an unpeopled limbo, for even "the veritist and the impressionist will try to submit gracefully to the method of the iconoclast who shall come when they in their turn are old and sad." These things being so, is it a sign of narrow consistency if the reader ask, Why, then, say elsewhere that "the surest way to write for all time is to embody the present in the finest form with the highest sincerity and with the frankest truthfulness"?

"Contemporaneousness," one finds, is the white robe of Mr. Garland's artistic faith, and mediocrity its palm branch, for "our national literature will come to its fulness when the common American rises spontaneously to the expression of his concept of life," and in that day "there will be no overtopping personalities in art," nor ever again "will any city dominate American literature." Instead, the real novelist of the elect sections "is walking behind the plough or trudging to school in these splendid potential environments," while "the novel of the slums must be written by one who has played there as a child, and taken part in all its amusements; not out of curiosity, but out of pleasure-seeking." And finally, from the "interior spaces" of the West comes the confession, "We propose to discard your nipping accent, your nice phrases, your balanced sentences, and your neat proprieties inherited from the eighteenth century. Our speech is to be as individual as our view of life."

Mr. Garland has written both prose and verse wherewith to illuminate his creed, and by them it should be judged no less than by its naked enunciation. The practice of most men is notoriously better than the worst of their dogmas, and Mr. Garland will not be found an exception to the rule. If one might venture to advise so bold and confident a spirit, it would be to make, in the name of the breadth he now and again eloquently advocates, yet another essay of the culture at present pronounced by him sterile, false, and dying.

BOOKS OF THE WEEK.

Academy Architecture. 1894. Scribners. $2.
Bates, Arlo. The Torch-Bearers. Boston: Roberts Bros. 50 cents.
Clark, J. W. Libraries in the Medieval and Renaissance Periods. Macmillan. $1.
Dunning, Rev. A. E. Congregationalists in America. J. A. Hill & Co. $2.75.
Emmet, W. Le L. Alternating Current Wiring and Distribution. The *Electrical Engineer*.
Forney, M. N. Political Reform by the Representation of Minorities. The Author.
Gardner, Sarah M. H. Quaker Idyls. Henry Holt & Co. 75 cents.
Hobson, J. A. The Evolution of Modern Capitalism. London: Walter Scott; New York: Scribners. $1.25.
Lee, Sidney. Dictionary of National Biography. Vol. XXXIX. Morehead–Myles. Macmillan. $3.75.
McCracken, W. D. Romance Switzerland. Teutonic Switzerland. 2 vols. Boston: Joseph Knight Co.
Nitti, F. S. Population and the Social System. London: Sonnenschein; New York: Scribners. $1.
O'Neill, Moira. An Easter Vacation. E. P. Dutton & Co. $1.25.
Pinkerton, Percy. Adriatica. London: Gay & Bird.
Rawnsley, Rev. H. D. Literary Associations of the English Lakes. 2 vols. Macmillan. $4.
Saunders, Bailey. Life and Letters of James Macpherson. London: Sonnenschein; New York: Macmillan. $2.00.