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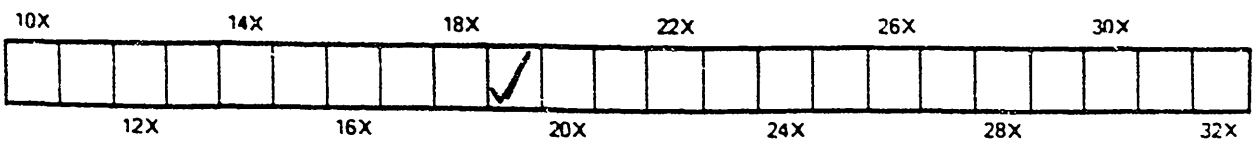

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THE METAPHYSICAL SOCIETY.

THE following attempt to give an impression of a typical meeting of the once rather famous "Metaphysical Society," of which I was throughout a member, must not be regarded as in any sense containing a historical report of an individual debate. No such reports were, so far as I know, ever taken. But to a rather diligent member of the Society there were plenty of opportunities of learning the general views of the more eminent members on such a subject as was discussed at the meeting here selected for treatment; and though it is likely that none of them, except of course Dr. Ward, whose paper was really read (though he may have made no final reply), spoke on this particular occasion, as I have imputed to them; and though several of those to whom I have attributed remarks *may not* have been present at this particular discussion at all, yet I do not think I shall be found to have misrepresented any of their views. If I have, the responsibility and fault are mine.

At the meeting of the Metaphysical Society which was held on the 10th of December, 1872, Dr. Ward was to read a paper on the question, "Can Experience prove the Uniformity of Nature?" "Middlemarch" had been completed and published a few days previously. On the day following the meeting the Convocation of Oxford was to vote upon the question raised by Mr. Burgun and Dean Goulburn, whether the Dean of Westminster (then Dr. Stanley) should be excluded for his heresies

from the List of Select Preachers at Oxford or not. The "Claimant" was still starring it in the provinces in the interval between his first trial and his second. Thus the dinner itself was lively, though several of the more distinguished members did not enter till the hour for reading the paper had arrived. One might have heard Professor Huxley flashing out a sceptical defence of the use of the Bible in board schools at one end of the table, Mr. Fitzjames Stephen's deep bass remarks on the Claimant's adroit use of his committal for perjury, at another, and an eager discussion of the various merits of Lydgate and Rosamond at a third. "Ideal Ward," as he used to be called, from the work on the "Ideal of the Christian Church," for which he had lost his degree nearly thirty years earlier at Oxford, was chuckling with a little malicious satisfaction over the floundering of the orthodox clergy, in their attempts to express safely their dislike of Dean Stanley's latitudinarianism without bringing the Establishment about their ears. He thought we might as well expect the uniformity of Nature to be disproved by the efforts of spiritualists to turn a table as the flood of latitudinarian thought to be arrested by Mr. Burgon's and Dean Goulburn's attempt to exclude the Dean of Westminster from the List of Select Preachers at Oxford. Father Dalgairns, one of Dr. Newman's immediate followers, who left the English Church and entered the Oratory of Saint Philip Neri with him, a man of singular sweetness and openness of character, with something of a French type of playfulness in his expression, discoursed to me eloquently on the noble ethical character of George Eliot's novels, and the penetrating disbelief in all but human excellence by which they are pervaded. Implicitly he intended to convey to me, I thought, that nowhere but in the Roman Church could you find any real breakwater against an incredulity which could survive even the aspirations of so noble a nature as hers. And as I listened to this eloquent exposition with one ear, the sound of Professor Tyndall's eloquent Irish voice, descanting on the proposal for a "prayer-gauge," which had lately been made in the *Contempo-*

rary Review, by testing the efficacy of prayer on a selected hospital ward, captivated the other. Everything alike spoke of the extraordinary fermentation of opinion in the society around us. Moral and intellectual "yeast" was as hard at work multiplying its fungoid forms in the men who met at that table as even in the period of the Renaissance itself.

I was very much struck then, and frequently afterwards, by the marked difference between the expression of the Roman Catholic members of our Society and all the others. No men could be more different amongst themselves than Dr. Ward and Father Dalgairns and Archbishop Manning, all of them converts to the Roman Church. But, nevertheless, all had upon them that curious stamp of definite spiritual authority, which I have never noticed on any faces but those of Roman Catholics, and of Roman Catholics who have passed through a pretty long period of subjection to the authority they acknowledge. In the Metaphysical Society itself there was every type of spiritual and moral expression. The wistful and sanguine—I had almost said hectic idealism—of James Hinton struck me much more than anything he contrived to convey by his remarks. The noble and steadfast but somewhat melancholy faith which seemed to be sculptured on Dr. Martineau's massive brow shaded off into wistfulness in the glance of his eyes. Professor Huxley, who always had a definite standard for every question which he regarded as discussable at all, yet made you feel that his slender definite creed in no respect represented the cravings of his large nature. Professor Tyndall's eloquent addresses frequently culminated with some pathetic indication of the mystery which to him surrounded the moral life. Mr. Fitzjames Stephen's gigantic force, expended generally in some work of iconoclasm, always gave me the impression that he was revenging himself on what he could not believe, for the disappointment he had felt in not being able to retain the beliefs of his youth. But in the countenances of our Roman Catholic members there was no wistfulness—rather an expression which I might almost describe as a blending of grateful

humility with involuntary satiety—genuine humility, genuine thankfulness for the authority on which they anchored themselves; but something also of a feeling of the redundance of that authority, and of the redundance of those provisions for their spiritual life of which almost all our other members seemed to feel that they had but a bare and scanty pasturage.

Dr. Ward, who was to read the paper of the evening, struck me as one of our most unique members. His mind was, to his own apprehension at least, all strong lights and dark shadows. Either he was absolutely, indefensibly, "superabundantly" certain, or he knew no more "than a baby," to use his favorite simile, about the subjects I conversed with him upon. On the criticism of the New Testament, for instance, he always maintained that he knew no more than a baby, though really he knew a good deal about it. On the question arising out of Papal Bulls he would often say that he was as absolutely and superabundantly certain as he was of his own existence. Then he was a very decided humorist. He looked like a country squire, and in the Isle of Wight was, I believe, generally called "Squeer Ward;" but if you talked to him about horses or land he would look at you as if you were talking in an unknown language, and would describe, in most extravagant and humorous terms, his many rides in search of health, and the profound fear with which, whenever the animal showed the least sign of spirit, he would cry out, "Take me off! take me off!" He was one of the very best and most active members of our Society, as long as his health lasted—most friendly to everybody, though full of amazement at the depth to which scepticism had undermined the creed of many amongst us. A more candid man I never knew. He never ignored a difficulty, and never attempted to express an indistinct idea. His metaphysics were as sharp cut as crystals. He never seemed to see the half-lights of a question at all. There was no penumbra in his mind; or, at least, what he could not grasp clearly he treated as if he could not apprehend at all.

When dinner was over and the cloth removed a waiter

entered with sheets of foolscap and pens for each of the members, of which very little use was made. The ascetic Archbishop of Westminster, every nerve of his face expressive of some vivid feeling, entered, and was quickly followed by Dr. Martineau. Then came Mr. Hinton, glancing round the room with a modest, half-humorous furtiveness, as he seated himself amongst us. Then Dr. Ward began his paper. He asked how mere experience could prove a universal truth without examining in detail every plausibly asserted exception to that truth and disproving the reality of the exception. He asked whether those who believe most fervently in the uniformity of Nature ever show the slightest anxiety to examine asserted exceptions. He imagined, he said, that what impresses physicists is the fruitfulness of inductive science, with the reasonable inference that inductive science could not be the fruitful field of discovery it is unless it rested on a legitimate basis, which basis could be no other than a principle of uniformity. Dr. Ward answered that the belief in general exceptions to the law of uniform phenomenal antecedents and consequents does not in the least degree invalidate this assumption of the general uniformity of Nature, if these exceptions are announced, as in the case of miracles they always must be, as demonstrating the interposition of some spiritual power which is not phenomenal, between the antecedent and its natural consequent—which interposition it is that alone interrupts the order of phenomenal antecedence and consequence. "Suppose," he said, "that every Englishman, by invoking St. Thomas of Canterbury, could put his hand into the fire without injury. Why, the very fact that in order to avoid injury he must invoke the saint's name would ever keep fresh and firm in his mind the conviction that fire does naturally burn. He would therefore as unquestionably in all his physical researches assume this to be the natural property of fire, as though God had never wrought a miracle at all. In fact, from the very circumstances of the case, it is always one of the most indubitable laws of nature which a miracle overrides, and those who wish most to magnify the miracle are led

by that very fact to dwell with special urgency on the otherwise universal prevalence of the law." There was a short pause when Dr. Ward had concluded his paper, which was soon ended by Professor Huxley, who broke off short in a very graphic sketch which he had been making on his sheet of foolscap as he listened.—

Dr. Ward, said Professor Huxley, had told us with perfect truth that the uniformity of Nature was only held by even the most thoroughgoing of clear-minded physicists as a fruitful working hypothesis, the assumption of which had led to a vast number of discoveries, which could not have been effected without it. If they could not assume that under heat the vapor of water would expand one day as it had expanded the previous day, no locomotive would be of any use; if they could not assume that under certain given conditions the majority of seeds put into the ground would spring up and reproduce similar seed, no fields would be sown and no harvest would be reaped. In innumerable cases where the same antecedents had apparently not been followed by the same consequents, thinking men had taken for granted that they must have been mistaken in supposing the antecedents to be the same, and had found that they were right, and that the difference in the antecedents had really been followed by the difference in the consequents. He, for his part, should not object at all to examine into any presumptive case of miracle sufficiently strong to prove that in a substantial number of cases Englishmen had been enabled to thrust their hands into the fire without injury by adopting so simple a safeguard as calling on St. Thomas of Canterbury. But the truth was, that asserted miracles were too sparse and rare, and too uniformly accompanied by indications of either gross credulity or bad faith, to furnish an investigator jealous of his time, and not able to waste his strength on futile inquiries, with a sufficient basis for investigation. Men of science were too busy in their fruitful vocation to hunt up the true explanation of cases of asserted miracle, complicated as they generally were with all sorts of violent prepossessions and confusing

emotions. He, for his part, did not pretend that the physical uniformity of Nature could be absolutely proved. He was content to know that his "working hypothesis" had been proved to be invaluable by the test of innumerable discoveries, which could never have been made had not that working hypothesis been assumed. Indeed, what evidence has any man, even for the existence of his own home and family, better than that of a fruitful hypothesis, which has time after time resulted in the expected verification? No man can be absolutely certain that the home he left an hour ago is still standing where it did, or that the family he left in it are still in life; still, if he acts on the hypothesis that they are there, he will, in innumerable cases, be rewarded for making that assumption by finding his expectations verified, and in but a very few cases indeed be disappointed.

If, then, Dr. Ward asks, said Professor Huxley, whether or not I hold that experience can, in a mathematical sense, *prove* the uniformity of Nature, I answer that I do *not* believe it; that I believe only that, in the assumption of that uniformity of Nature, we have a working hypothesis of the most potent kind, which I have never found to fail me. But further, if I might use the word "believe" loosely, though with much less looseness than that with which men who are not students of science habitually use it, I should not hesitate to avow a belief that the uniformity of Nature *is* proved by experience, for I should be only too glad to think that half the "demonstrated" beliefs of metaphysicians are even a tenth part as trustworthy as the great working hypothesis of science; however, "who commits himself to even one statement which turns out to be devoid of good foundation, loses somewhat of his reputation among his fellows, and if he is guilty of the same error often he loses not only his intellectual but his moral standing among them; for it is justly felt that errors of this kind have their root rather in the moral than in the intellectual nature." That, I suppose, is the reason why men of science are so chary of investigating the trustworthiness of the *soi-disant* miracles to which Dr. Ward

is so anxious that we should pay an attention much greater than any which in my opinion they deserve. For the scientific man justly fears that if he investigates them thoroughly, he shall wound many amiable men's hearts, and that if he does not wound amiable men's hearts, he shall compromise his own character as a man of science.

As Professor Huxley's rich and resonant voice died away, Father Dalgairns, after looking modestly round to see whether any one else desired to speak, began in tones of great sweetness: Professor Huxley has implied that to the scientific student the words "I believe" have a stricter and more binding force than they have to us theologians. If it really be so, it is very much to our shame, for no words can be conceived which are to us more solemn and more charged with moral obligation. But I confess that the drift of Professor Huxley's remarks hardly bore out to my mind the burden of his peroration. It seems that "a working hypothesis" is the modest phrase which represents even the very maximum of scientific belief, for would Professor Huxley admit that he has any belief, except of course one resting on an immediately present consciousness, deeper than his belief in the uniformity of Nature? I suppose not. Now theologians are accustomed to assert, and I think with justice, that it is impossible to entertain any belief—whether it be only a working hypothesis or something more—in the uniformity of Nature, without basing it on the irrefragable trustworthiness of the human faculties. In one of our earliest discussions Dr. Ward proved his case that on the irrefragable trustworthiness of memory, for example, for all facts which it positively asserts, rests the whole structure of human knowledge; and this in a sense much deeper than any such expression as "working hypothesis" will express. Without assuming this irrefragable trustworthiness, Dr. Ward has reminded us that I could not now know that I am replying to Professor Huxley at all, or indeed who I myself am, or who is Professor Huxley. Without absolutely assuming the trustworthiness of memory, how should I have the least glimmering of a concep-

tion of that expressive personality from whose mouth the weighty utterances we have just heard proceeded? Yet if you grant me the trustworthiness of memory, when it speaks positively of a recent experience, can you deny me the trustworthiness of other human faculties equally fundamental? Is my "belief" in the distinction between right and wrong, between holiness and sin, any less trustworthy than my belief in the asseverations of my memory? Did not Professor Huxley himself suggest in his closing remarks that the *moral* roots of our nature strike deeper than the intellectual roots; in other words, that if memory be much more than a "working hypothesis," if its trustworthiness be the *condition* without which no working hypothesis would be even possible, there are moral conditions of our nature quite as fundamental as even the trustworthiness of memory itself? I hold it, I confess, most irrational to have an absolute and undoubting belief in the uniformity of Nature based on any accumulation of experience, for no such accumulation of experience is possible at all without an absolute and undoubting belief in the Past, and this no merely present experience can possibly give us. And I hold such a belief in the uniformity of Nature, based on anything but the trustworthiness of our faculties, to be irrational, for precisely the same kind of reason for which I hold it to be irrational to question the belief in God. The solemnity which Professor Huxley attaches to the words "I believe," I attach to them also. Moreover, I could not use them in their fullest sense of anything which I regard merely as a "working hypothesis," however fruitful. But I deny that we theologians regard our deepest creed as a working hypothesis at all. We accept the words "I believe in God," as we accept the words "I believe in the absolute attestations of memory," as simply forced upon us by a higher intuition than any inductive law can engender. When I say "I believe in God," I use the word believe just as I use it when I say "I believe in moral obligation," and when I say "I believe in moral obligation," I use the word believe just as I do when I say "I believe in the attesta-

tions of memory." "God is not necessary only to my conception of morality. His existence is necessary to the existence of obligation." I know God by "a combination of intuition and experience, which is Kant's condition of knowledge. If there be a God, our imagination would present Him to us as inflicting pain on the violator of His law, and lo! the imagination turns out to be an experienced fact. The Unknowable suddenly stabs me to the heart." I believe in the uniformity of Nature only in the sense in which I believe in every other high probability—for instance, only in the sense in which I believe that the sun will rise to-morrow. I believe in God in the sense in which I believe in pain and pleasure, in space and time, in right and wrong, in myself, in that which curbs me, governs me, besets me behind and before, and lays its hand upon me. The uniformity of Nature, though a very useful working hypothesis, is, as Professor Huxley admits, unproved and unprovable as a final truth of reason. But "if I do not know God, then I know nothing whatsoever," for if "the pillared pavement is rottenness," then surely also is "earth's base built on stubble."

There was a certain perceptible reluctance to follow Father Dalgairns, which lasted some couple of minutes. Then we heard a deep-toned, musical voice which dwelt with slow emphasis on the most important words of each sentence, and which gave a singular force to the irony with which the speaker's expressions of belief were freely mingled It was Mr. Ruskin. "The question," he said, "Can experience prove the uniformity of Nature? is, in my mind, so assuredly answerable with the negative which the writer appeared to desire, that precisely on that ground the performance of any so-called miracles whatever would be really unimpressive to me. If a second Joshua to-morrow commanded the sun to stand still, and it obeyed him, and he therefore claimed deference as a miracle-worker, I am afraid I should answer, 'What! a miracle that the sun stands still?—not at all. I was always expecting it would. The only wonder to me was its going on.' But even assuming the demonstrable uniformity of the laws or customs

of Nature which are known to us, it remains to me a difficult question what measure of interference with such law or custom we might logically hold miraculous, and what, on the contrary, we should treat only as proof of the existence of some other law hitherto undiscovered. For instance, there is a case authenticated by the signatures of several leading physicians in Paris, in which a peasant girl, under certain conditions of morbid excitement, was able to move objects at some distance from her without touching them. Taking the evidence for what it may be worth, the discovery of such a faculty would only, I suppose, justify us in concluding that some new vital energy was developing itself under the conditions of modern life, and not that any interference with the laws of Nature had taken place. Yet the generally obstinate refusal of men of science to receive any verbal witness of such facts, is a proof that they believe them contrary to a code of law which is more or less complete in their experience, and altogether complete in their conception; and I think it is therefore the province of some one of our scientific members to lay down for us the true principle by which we may distinguish the miraculous violation of a known law from the natural discovery of an unknown one." "However," he proceeded, "the two main facts we have to deal with are that the historical record of miracle is always of inconstant power, and that our own actual energies are inconstant almost in exact proportion to their worthiness. First, I say the history of miracle is of inconstant power. St. Paul raises Eutychus from death, and his garments effect miraculous cure, yet he leaves Trophimus sick at Miletus, recognizes only the mercy of God in the recovery of Epaphroditus, and, like any uninspired physician, recommends Timothy wine for his infirmities. And in the second place, our own energies are inconstant almost in proportion to their nobleness. We breathe with regularity, and can count upon the strength necessary for common tasks, but the record of our best work and our happiest moments is always one of success which we did not expect, and of enthusiasm which we could not prolong."

As Mr. Ruskin ceased, Walter Bagehot, the then editor of the *Economist*, and a favorite amongst us for his literary brilliance, opened his wide black eyes, and, gulping down what seemed to be an inclination to laugh at some recollection of his own, said: Mr. Ruskin's remark that he had always been expecting the sun to stand still was to me peculiarly interesting, because, as I have formerly told the Society, whatever may be the grounds for assuming the uniformity of Nature, I hold that there is nothing which the natural mind of man, unless subjected to a very serious discipline for the express purpose of producing that belief, is less likely to assume. A year or two ago I ventured to express in this room the opinion that credulity is the *natural* condition of almost every man. "Every child," I said, "believes what the footman tells it, what the nurse tells it, and what its mother tells it, and probably every one's memory will carry him back to the horrid mass of miscellaneous confusion which he acquired by believing all he heard." I hold that children believe in the suggestions of their imaginations quite as confidently as they believe in the asseverations of their memories; and if grown-up men do not, it is only that their credulity has been battered out of them by the hard discipline of constant disappointment. What can be better evidence that there is at least no *à priori* belief in the uniformity of Nature than the delight in fairy tales, which, certainly in childhood, are accepted with quite as much private belief that some great enchanter's wand will be triumphantly found at last, as are the dullest and most matter-of-fact of histories. Indeed, you will find in almost every young person of any promise the profoundest tendency to revolt against the law of uniform succession as too dull to be credible, and to exult in the occasional evidence which the history of their time affords that "truth after all is stranger than fiction." Is not the early love of tales of marvel, and the later love of tales of wild adventure and hair-breadth escapes, and again, the deep pleasure which we all feel in that "poetic justice" which is so rare in actual experience, a sufficient proof that men

retain, even to the last, a keen prepossession against the doctrine that laws of uniform antecedency and consequence can be traced throughout the most interesting phases of human life? Even in the city, where so many hopes are crushed every day, the "Bull" goes on believing in his own too sanguine expectations, and the "Bear" in his own dismal predictions, without correcting his own bias as experience should have led him to correct it. I believe it will be found that nothing is more difficult than to beat into the majority of minds the belief that there is such a thing as a "law of nature" at all. So far as I can judge, nine women out of ten have never adequately realized what a law of nature means, nor is the proportion much smaller for men, unless they have been well drilled in some department of physics. Of course I heartily agree with Dr. Ward that experience cannot *prove* the uniformity of Nature, and for this very good reason, amongst others, that it is impossible to say what the uniformity of Nature means. We cannot exhaust the number of interfering causes which may break that uniformity. I at least cannot doubt that, so far as mind influences matter, there may be a vast multitude of real disturbing causes introduced by mind to break through those laws of uniformity in material things, of which at present we know only the elements. But of this I am very sure, that at present we are much apter to accept superficial and inadequate evidence of the breach of laws of uniformity than we ought to be; that education does not do half enough to beat out of our minds that credulous expectation that there is some disposition in the governing principles of the universe, either to favor us or to persecute us, as the case may be, which springs, not from experience, but from groundless prejudice and prepossession; and that much greater efforts should be made to set before young people the true inexorability of Nature's laws than is actually made at present. It is quite true that no man can say positively either that the sun will rise to-morrow, or that an iron bar will fall to the ground if the hand drops it. We do not absolutely *know* that the sun may not blaze up and go out

before to-morrow as it is said that some stars of considerable magnitude have blazed up and gone out. We do not know that there may not be some enormously powerful and invisible magnet in the neighborhood which will attract the iron bar upwards with more force than that with which the earth pulls it downwards. But we do know that in millions and billions of cases expectations founded on the same sort of evidence as the expectation that the sun will rise to-morrow, and that the dropped bar will fall to the earth, have been verified, and that the imaginative illusion which half-educated people still so often indulge, that exceptions will occur, for the occurrence of which there is no rational evidence, is a most mischievous one, which we ought to try to eradicate. We ought to engage what I have ventured in this Society to call the "emotion of conviction," the caprices of which are so extravagant and so dangerous, much more seriously on the side of the uniformity of Nature than we have ever hitherto done. We should all try to distinguish more carefully than we do between possibility, probability, and certainty. It is not as certain that the sun will rise to-morrow as it is that I was cold before I entered this room; it is not as certain that Messrs. Baring's acceptances will be paid, as it is that the sun will rise to-morrow; it is not as certain that Peel's Act will always be suspended in a panic, as it is that Messrs. Baring's acceptances will be paid. And it is difficult for "such creatures as we are" to accommodate our expectations to these varying degrees of reasonable evidence. But though experience, however long and cumulative, can never prove the absolute uniformity of Nature, it surely ought to train us to bring our expectations into something like consistency with the uniformity of Nature. And as I endeavor to effect this in my own mind I certainly cannot agree with Mr. Ruskin that I have always been "expecting" the sun to stand still. Probably as a child I was always expecting things quite as improbable as that. But if I expected them now I should not have profited as much by the disillusionizing character of my experience as I endeavor to hope that I actually have.

There was a general smile as Bagehot ceased, but the smile ceased as Mr. Fitzjames Stephen — the present Sir James Stephen—took up the discussion by remarking, in a mighty bass that always exerted a sort of physical authority over us, that while the Society seemed to be pretty well agreed upon the main question, namely, that the uniformity of Nature could not be absolutely proved by experience, or, indeed, by any other method, there was a point in Dr. Ward's paper, namely, the challenge to examine seriously into the authenticity of miracles which had not been dealt with. For my part, he said, I am quite ready to examine into the evidence of any so-called miracle, that is, into the evidence of any unusual event which is offered to prove Divine interference in our affairs, when it comes before me with sufficient presumption of authority to render it worth my while to investigate it; though I probably should not agree with Dr. Ward as to what constitutes such a presumption. Certainly "a bare uncorroborated assertion by a person professing to be an eye-witness of an event is not sufficient evidence of that event to warrant action of an important kind based upon the supposition of its occurrence. When you are obliged to guess, such an assertion may be a reason for making one guess rather than another. Less evidence than this would make a banker hesitate as to a person's credit, or lead a customer to doubt whether his banker was solvent; but in such cases all that is possible is a guess more or less judicious, and a guess, however judicious, is a totally different thing from a settled rational belief. As regards all detailed matters of fact, I think there is a time, greater or less, during which the evidence connected with them may be collected, examined, and recorded. If this is done a judgment can be formed on the truth of allegations respecting them at any distance of time. Such judgments are rarely absolute; they ought always, or nearly always, to be tempered by some degree of doubt, but I do not think they need be affected by lapse of time. If, however, this opportunity is lost, if no complete examination is made at the time of an incident, or if being

made it is not properly or fully recorded, clouds of darkness which can never be dispelled settle down upon it almost immediately. All that remains behind is an indistinct outline which can never be filled up. Under certain conditions rare occurrences are quite as probable as common ones. The main condition of the probability of such an event is that the rare occurrence should, from its nature and from the circumstances under which it occurs, be capable of being observed, and that the evidence of it should be recorded in the manner which I have already described. If a moa were caught alive and publicly exhibited for money, or if the body of a sea-serpent were to be cut up upon the coast and duly examined by competent naturalists,the existence of moas and sea-serpents could be proved beyond all reasonable doubt. The reason why their existence is disbelieved or doubted is not that they are seen, if at all, so seldom, but because in each particular instance they are seen, if at all, in such an unsatisfactory way that it is doubtful whether they ever were seen. There are innumerable ghost-stories in circulation, but, as far as I know, no instance has ever yet been even alleged to exist in which the existence of a ghost has been properly authenticated as readily and as conclusively as that of any other being whatever. Stories of the interference of unseen agents stand upon exactly the same footing, speaking generally. Isolated instances occur in all ages and countries, but the common characteristic of them all is to be unauthenticated. Ten cases distinctly proved under the conditions referred to . . . would do more to settle the question of the existence of miracles as a class than innumerable cases depending on assertions which were not properly examined when they were originally made, and which can now never be examined. On the other hand, what reason can possibly be suggested why the action of an invisible person upon matter should not be ascertained just as clearly as the action of a visible person? The restoration of a dead body to life might, if it occurred, be proved as conclusively and as notoriously as the death of a living body, or the birth of a child. If such events formed a

real class to which new occurrences might be assigned, a large number of instances of those occurrences would be, so to speak, upon record, established beyond all doubt, and the very existence of the controversy shows that nothing of the sort exists."

Hereupon the Archbishop of Westminster, looking at Mr. Stephen with a benign smile, said: "Mr. Stephen's investigations into the evidence of the interference of unseen agents in human affairs are hardly on a par with some of those undertaken by the Church to which I belong. In canonizing, or even beatifying those who are lost to us, the Holy See has long been accustomed to go into the evidence of such events as those to which Mr. Stephen has just referred, and that with a disposition to pick holes in the evidence, which, if he will allow me to say so, could hardly be surpassed even by so able a sifter of evidence as Mr. Stephen himself. Nor is it indeed necessary to go into the archives of these laborious and most sceptically conducted investigations. If there were but that predisposition amongst Protestants to believe in the evidence of the unseen which Dr. Ward desired to see, there would, I am convinced, be many believers in miracles of the most astounding kind, and of miracles that have happened in our own time, many within the last year. Let those who choose, for instance, look into the evidence of the most astonishing cure of varicose veins which took place only last year in the south of France—a malady of thirty years' standing, and of steady progress throughout that time, attested on the positive evidence of French physicians who had themselves repeatedly seen and prescribed for the patient. Yet they admitted that all they could do would be at most to alleviate his sufferings by the application of mechanical pressure—and they nevertheless declared the cure to have been effected in a single night, the only new condition having been the believing application of the Lourdes water to the body of the sufferer. Here is a case where all Mr. Fitzjames Stephen's conditions are satisfied to the full. I do not, however, apprehend that Mr. Stephen will sift the evidence, or even regard it as worth his serious attention. He has hardly assigned suffi-

cient force to that strong predisposition to incredulity which is so widely spread at this moment in the Protestant world—a predisposition which I cannot entirely reconcile with Mr. Bagehot's very striking remarks on the universal credulousness of the natural man. Perhaps, however, there may be such credulousness where there is no prejudice, and yet incredulity still more marked where there is. I have been a careful observer of the attitude of Protestants in relation to the controversy between the natural and supernatural. I have seen its growth. I have watched its development. I am persuaded that Mr. Stephen is quite wrong in supposing that the matter can be settled as one of evidence alone. You must first overcome that violent prejudice in your minds which prevents you from vouchsafing even a glance at the evidence we should have to offer you. But I will, if the Society permits me, leave that part of the subject and return to the principal question before us—the impossibility of proving the uniformity of Nature from experience alone. Now, how do we Catholics, who have a philosophy the value of which we imagine that you believers in Spencer and Mill and Bain greatly underrate, account for the uniformity of Nature without trenching in any way on the supernatural basis of that Nature? I will show you. Aquinas says in his *Summa* —and the Archbishop, of course, pronounced his Latin in the Continental manner—"Tota irrationalis natura comparatur ad Deum sicut instrumentum ad agens principale;"—the whole of inanimate and irrational Nature bears to the Divine Being the relation of an instrument to the principal agent. That is to say, the Divine intellect conceives the law which the Divine will sanctions and enforces by a great methodical instrument. The *natura naturans* makes use of the *natura naturata*. The law determines the instrument it is to use, and the instrument it is to use determines the world. Why, then, should the law be regular and not variable? Why, because it is the instrument of a Being who is not ariable. The Schoolmen tell us that Nature has an appetite, a desire to accomplish its ends. They say of Nature "appetit," "desiderat." Such are the

phrases they use. And as no constant aim, no true development, can be attained by capricious, inconsistent, inconsequent action, by instruments incoherent, part with part—for the gratification of Nature's appetite, for the fulfilment of her desire, and the attainment of her purpose, a constancy and fixity of method are essential which are never interrupted, save where the Divine power modifies the instrument for its own good purpose. Thus the uniformity of Nature is based upon the wisdom of God, and the wisdom of God is manifested in the uniformity of Nature. St. Thomas has said: "Proprium est naturæ rationalis ut tendat in finem quasi se agens et ducens ad finem." And again: "Necessitas naturalis inhærens rebus, quâ determinantur ad unum, est impressio quædam Dei dirigentis ad finem, sicut necessitas quâ sagitta agitur ut ad certum signum tendat, est impressio sagittantis et non sagittæ;" that is, the necessity, or may we not say the uniformity of Nature, is a career impressed upon it by the Divine archer, who never misses His mark; it is not the arrow which determines that career, but the archer who points and who dismisses the arrow in its flight. But St. Thomas goes on: "Sed in hoc differt, quod id quod creaturæ a Deo recipiunt est earum natura, quod autem ab homine rebus naturalibus imprimitur præter earum naturam ad violentiam pertinet." Dr. Ward will correct me if I am wrong, but I interpret this as meaning that if what men engraft on lower creatures is spoken of by the angelic doctor as doing them a certain violence, altering, I suppose, their mere involuntary qualities by infecting them with a certain human purposiveness not their own, how much more is it evidently open to the Divine purpose to engraft on this uniformity of nature a supernatural bent of its own, to open it, as it were, to the power of miracle, to infuse it with the significance of revelation?

Dr. Ward, I thought, winced a little when this appeal was made to him; whether it was that he differed with the Archbishop as to the drift of the passage quoted, or whether he regarded the Society as in general too little educated in philosophy to appreciate arguments derived from the teaching of

St. Thomas. As the Archbishop ceased a good many eyes were turned upon Dr. Martineau, as if we had now got into a region where no less weighty a thinker would be adequate to the occasion.

I think, said Dr. Martineau, speaking with a singularly perfect elocution, and giving to all his consonants that distinct sound which is so rare in conversational speech, I think that the course of this discussion has as yet hardly done justice to the *à priori* elements in human thought which have contributed to the discovery of the general uniformity of Nature, and to the axiomatic character of the principle which we are discussing. I should not entirely agree with the Archbishop or with St. Thomas if I rightly apprehended the quotations from him, that we ought to ground our belief in the uniformity of Nature *primarily* on our belief in the constancy of the Divine mind. Historically, I doubt whether that could be maintained. For example, the Hebrew Scriptures, which are full of the praise of the moral constancy of the Creator, appear to attach very little importance to the uniformity of Nature's methods, which they often treat as if they were as pliant as language itself to the formative thought behind it. Still less can I agree with Mr. Bagehot's view that everything which rushes into the mind is believed without hesitation till hard experience scourges us into scepticism. I should say rather that the understanding is prepared to accept uniform laws of causation by the very character of human reason itself. It is remarkable enough that Aristotle fully recognizes the close connection between the necessary character of human inference and the necessary relation of cause with effect, that he treats the "beginning of change" (ἀρχὴ κινήσεως) as either the cause which necessarily results in an effect, or the reason which necessarily results in an inference. "An efficient cause therefore may be found in any beginning of change either in the physical world or the logical. In both cases it has the same characteristics: *necessity*, whether in the form of inevitable sequence or in that of irresistible inference; and *consecutive advance*, a step at a time, along a determinate

line, whether in outward nature or in inward thought. Whatever it is, it either acts out or thinks out what is *next*. So far, therefore, as the universe is at the disposal of efficient causes, its condition at each moment results purely from the immediately prior, without the possibility of any new beginning. If an experienced observer could compress into a formula the law of all the simultaneous conditions, he would be able to foresee the contents of any future moment—not, however, to modify them, for his prescience depends on their being in themselves determinate, and on his calculations embracing all the elements of the problem, including the states of his own mind. This efficient causality can be denied by no one who admits the dynamic idea at all; and no phenomenon can dispense with it."

Here we have, as I conceive, the clue to the principle of the uniformity of Nature. So far as Nature is purely dynamic, and so far as force is measured by reason, we cannot stray from the rigid logic of fact, and the equally rigid logic of thought. Doubtless it will be replied that, as in the mind of man there is a free spring of force, which is as yet undetermined, which is potential and not actual force, so there is behind Nature a free spring of force which is as yet undetermined, which is potential and not actual nature—in short, a power above nature, and capable of modifying it; in other words, supernatural. And that doctrine I should heartily accept. The uniformity of Nature is the uniformity of force, just as the uniformity of reasoning is the uniformity of thought. But just as the indeterminateness of creative will stands behind the determinateness of the orbit of force, so the indeterminateness of creative purpose stands behind the determinateness of the orbit of thought or inference. I hold that man is not wholly immersed in dynamic laws,—that though our physical constitution is subject to them, our mental constitution rises above them into a world where free self-determination is possible. I do not wonder, therefore, that we find it difficult to realize the rigidity of the laws of efficient causation even so far as it would be good for us to realize them. But I cannot think

that any one who has once contracted the habit of even fixing his own attention can doubt for a moment that cause and effect are connected together by efficient links, nor that, if force outside us means the same thing as force inside us, the relation of cause and effect is as necessary—unless some higher power interfere to modify the cause—as the relation of premises to conclusion. With regard to Dr. Ward's invitation to us to examine more carefully the credentials of miracle, I am inclined to agree with Mr. Stephen, that if there were any tangible number of incontrovertible miracles, there could be no controversy on the question whether or not such things can be. But then I should not apply that remark to any case of internal consciousness of supernatural influence, because, from the very circumstances of the case, the evidence of the existence of such influence cannot be open to any mind, except that which is the subject of it, and in my view it is quite unreasonable to deny that there are indirect but yet conclusive proofs in history that such supernatural influences have transformed, and do still habitually transform, the characters of the very greatest of our race. But it is one thing to see the evidence of spiritual influence in every page of human history, and quite another to attach importance to such preternatural occurrences as the Archbishop has recently referred to, which are usually so mixed up with superstitions of all kinds, and so great a variety of hysterical emotions, that I for one should despair of any good result from investigating minutely these curious conquests effected by pretentious physical marvels over the gaping intellectual credulity of moral coldness and disbelief.

Here the general discussion ended, but Dr. Ward, who had the right of reply, exercised it with alertness and vigor.

I cannot understand, he said, Dr. Martineau's position, that because the best testimony which we have in modern times to the interference of Divine power in the chain of physical causation is more or less mixed up with what he would regard as superstition and hysterical emotion, therefore it is perfectly justifiable to leave such matters uninvestigated, and to pass by

on the other side. Surely the whole character of modern civilization would be altered if we could prove satisfactorily for ordinary minds that the Divine will is a true cause, which manifests itself habitually to those who humbly receive the Divine revelations. Is not Dr. Newman's celebrated assertion that England would be in a far more hopeful condition if it were far more superstitious, more bigoted, more disposed to quail beneath the stings of conscience, and to do penance for its sins, than it is, at least plausible for one who, like Dr. Martineau, believes profoundly that a true worship of a righteous will is the highest end of all human life? Can anything be more superabundantly evident, more conspicuously and, so to say, oppressively clear, than that ninety-nine men out of every hundred live as if God were at most nothing more than a remote probability, which it is hardly worth while to take into account in the ordinary routine of life? Suppose, if you please, that the majority of men by studying the Lourdes miracles will be brought, if they are convinced at all, to burn an immense number of wax tapers to the holy Virgin, and to dress up a number of very gaudy dolls in the churches dedicated to her, by way of showing their gratitude to her for curing paralytics and other miserable sufferers by the application of Lourdes water. Is that so much more superstitious after all than attributing similar cures to the transit of St. Peter's shadow, or to handkerchiefs taken from St. Paul's body, as the author of the Acts of the Apostles certainly did? Nor, indeed, is it a matter of the very highest moment whether people show their faith foolishly or whether it overshoots the mark, and attributes imaginary effects to a real cause. What is a matter of the highest moment is whether or not they feel or do not feel their religious faith in every action of their life. If God is really ruling you, is it not better to feel His eye upon you, even though you show your sense of that vigilance unreasonably and foolishly, than to live on very much as you would do, if, as Isaiah said, God were on a journey or had gone to sleep? Can any one deny that any awakening, however

rude its consequences, to the reality of Divine power, would be infinitely better than the rapidly-growing habit of living as if behind Nature there were no God? I do not of course say this to any member of our Society who doubts the reality of God's government, but only to those who, with Dr. Martineau, regard it as the very first of all truths. But to them I say, if miracles still exist, if they still exist in the very form in which they are said to have existed in the Acts of the Apostles, if they can be attested by men of science themselves, if, in any Church, they happen not merely every year, but in considerable numbers every year, and admit of all the tests to which Mr. Stephen has referred us, then surely it can be nothing but a most reprehensible and guilty fastidiousness to give the go-by to the evidence of these things, simply on the ground that they are mixed up with a great deal of vulgar taste and of hysterical feeling. Is it not better to have a vulgar belief in God, than to have a fine susceptibility to scientific methods? Is it not better to have a feverish longing to do His will, than to have a delicate distaste for morbid devotion? The uniformity of Nature is the veil behind which, in these latter days, God is hidden from us. I believe in the uniformity of Nature, but I believe in it far more fervently as the background on which miracle is displayed, than I do merely as the fertile instrument of scientific discovery and of physical amelioration.—*R. H. Hutton.*

British Association.—Last year the British Association for the Advancement of Science met in Canada, and this year it meets in Birmingham, Eng., under the presidency of a Canadian, Sir William Dawson, LL.D., F.R.S., of McGill University. The date of meeting is fixed at September 1st. This will be the fourth meeting in this city, the previous meetings having been in the years 1838, 1849 and 1865 respectively.

It is possible to be more shocked by a discourtesy than by a crime.—*Dr. Parker.*

AN EVENING IN THE SCIENCE ASSOCIATION.

ON the evening of the 20th of January, the Science Association and many friends met in Faraday Hall, Cobourg, to listen to the delivery of the President's Inaugural Address, by Mr. James Elliott, and its discussion by several members. The Rev. Dr. Burwash, the Dean of the Faculty of Theology of Victoria College, acted as chairman. The following addresses formed the evening's discussion on the subject—

LIBERAL EDUCATION.

INAUGURAL ADDRESS BY MR. ELLIOTT.

OF all many-sided subjects education is the one which has the greatest number of sides. It includes whatever we do for ourselves, and whatever others do for us, for the express purpose of bringing us somewhat nearer to the perfection of our complex nature. But it does more. In its widest acceptance, it comprehends the indirect effects produced on our faculties and character by things of which the direct purposes are quite different. Laws, forms of government, modes of social life, climate, soil, and local position, have all a powerful though in a great degree imperceptible influence in the formation of human character. In this broad sense, whatever helps to shape the human being, to make him what he is, or prevent him from being what he is not, is part of his education. Education, then, is the developing or perfecting of all the root-principles of man's nature, which, of course, implies the correction of all wrong tendencies. It is not the possession of knowledge, only in so far as knowledge makes the man wiser, better, more profound in his thinking, more far-reaching in his insight, more comprehensive, disinterested, and humanity-embracing in his purposes and plans. A man may know much, and yet know little and be less. He may have a most accurate knowledge of history, as to its facts, while he has very little knowledge of that history as to its lessons. He may know that certain kings lived and died, that certain empires arose, flourished, faded,

crumbled, or were buried in their own ashes, while he has completely failed to grasp the why and how of success and failure in the case of individuals or nations. He may have a correct knowledge of historical facts, and yet be utterly ignorant of the great lessons which those facts are designed to teach. To gain true education, we must know the facts. But we must know more. We must know why the facts are as we find them, and how they may be perfected and perpetuated if good, and corrected if evil.

What is needed to elevate man's essential nature is not that he should be an encyclopædia, but that he should have great ideas. These must be based on knowledge of facts. Great ideas may be evolved by the pursuit of various studies, and all studies may be pursued by men who never possess one single great idea.

Education, then, is the developing of man's powers, systematically and symmetrically, so that there will be the greatest possible capacity in both thought and action. Of course, these powers must be trained to act in harmony, so that there will be the least possible waste in any direction. This mind, thus developed, must be furnished with the knowledge of which we have need. We are blindly groping about, and constantly damaging ourselves by collision with men, and with the laws of nature which are laws of God. We need to thoroughly understand our relation to both the one and the other. So much for general education.

We now turn to our subject proper, liberal education. Liberal education is incapable of exact and permanent definition. Indeed it can be defined but in a very general manner at any given time. As humanity, intellectually and morally, presses toward a higher height, the boundaries of liberal education become extended. True, the knowledge of some branches of learning can never be omitted from a liberal education. Such are mathematics and formal logic. These subjects train men to think; and the power to think consecutively, intensely, profoundly, and clearly, is indispensable to a liberal education. In other departments its boundaries change.

The time was when to be ignorant of a quantity in Homer would have caused any man who regarded himself as possessed of a liberal education to blush crimson. But that same man, perhaps, never once thought of inquiring into the functions of the various parts of his complex nature, into the relation of man to man, or of mankind to law, both physical and spiritual. Things are different now. Perhaps we have swung to the opposite extreme. Be that as it may. No man can now claim to be educated who is ignorant of himself, who is ignorant of Nature and her laws, who is ignorant of the fundamental principles of political economy, who is ignorant of the history of the past in its relation to the present, and of the present in its relation to itself and the future.

Possessing a knowledge of these things, a man will be readily, perhaps too readily, excused from a knowledge of the ancient languages. Such is the tendency of this utilitarian age. We prefer the useful to the ornamental, or to that which has outlived its chief utility. A thorough command of language, however, facilitates both the evolution and expression of thought. Hence, if we would think profoundly and express our thought clearly, we must become thoroughly skilled in the use of our mother-tongue. The English language thoroughly mastered will be a treasure of inestimable value. Other languages may, with profit, be studied as an aid to this. Some, as the German, open up before us the most advanced thought before it is translated into English, and, even when so translated, it fails to place its wealth of meaning at the feet of any one who has not made himself familiar with the original. How often, as we have struggled through the labyrinths of Kantian philosophy, have we sighed for a correct knowledge of the language of that great transcendentalist! As far as practicable, the cultured man should understand the languages of all the most advanced peoples.

Liberal education may, perhaps, be provisionally defined as the acquisition, evolution, or development, of a power of thought a keenness of insight, a depth and purity of feeling, and a

nobility of purpose, considerably in advance of the average of our times. To this must be added a reliable knowledge of the fundamental principles of all those sciences which bear directly on human life and destiny.

Such an education gives power. It gives power over the forces of Nature. We have but to visit a few of our great manufactories, to step into a telegraph office, to stand for a few moments by a telephone, in order to feel convinced that to the energy of the foaming cataract, to the wild fury of the tempest, to the fierce and rapid lightning, the man who thoroughly understands Nature's laws can say, "Do this," and they obey him.

It gives power over men. Every thoughtful student of history must feel convinced that power has fallen, is falling, and will fall more and more into the hands of those who have brains that can think for the rest. These men have taken hold of their inborn powers and developed them. They have utilized the grand heritage of truth bequeathed to them by the upward struggle of the past of our race. They have learned how to utilize the forces of Nature. They know how to place the human mind in the right attitude toward truth. Hence power is falling into their hands. This is especially so now. Aristocracies of mere birth are failing. Aristocracies of mere wealth are faint at heart, and destined ere long to give up the ghost. Genius is good. But even the aristocracy of mere genius, unguided by liberal culture, is losing its influence on humanity, and the world is recognizing the aristocracy of thought. Socrates, Plato, Aristotle, Kant, Fichte, Hegel, Adam Smith, Carlyle, Ruskin, Lorimer, Emerson, Spencer, Huxley, and such like men, in no small degree, rule the world. They do more to mould public opinion and to regulate the relations of man to man than all the crowned heads that ever lived. The world could have spared many of its kings, courtiers and office-seekers without much loss, and perhaps with some gain. It could not, without great hurt, part with one of its seers.

Those who have best developed their powers shall reign, and

their rule will be characterized by a liberty which is not license, by an equality consistent with natural and acquired inequalities, by a fraternity and humanity wide and at the same time sympathetic, tender, helpful.

Do we wish, then, to be great with truest greatness, to be strong with truest strength, to be free with truest freedom, to be kind with truest kindness, in a word, to fill nobly our place in the universe by placing the present and future a little in advance of the past, we must cultivate to the highest the faculties of which we find ourselves in possession.

I notice, further, that liberal education is the strongest and most faithful ally to pure religion. It is true that sometimes it raises difficulties. But if religion is to be advanced all difficulties must be laid open. We must even search for those that are hidden. And why? Every difficulty calls forth a remedy which cannot be discovered without gaining either in extent or in exactness. Thus even obstacles become the means of increasing the thoroughness of religion. But if difficulties are intentionally concealed, or if when manifest they obtain anything other than honest treatment, then the tendency of those difficulties together with this treatment cannot be other than to overthrow religion in absolute scepticism. The thorough investigation of even the difficulties which seem, to our dark eyes, attached to religion is of greatest service to true piety, and, I venture to say, is pleasing to God. There is truth as well as liberality in the words of Proctor, "This is true homage to the Mightiest Power, to ask man's boldest question, undismayed by muttered threats that some hysteric sense of wrong or insult will convulse the throne where Wisdom reigns supreme." The fact is, all study rightly conducted leads to God. On this point I cannot do better than quote two eminent authors. The Rev. Charles Kingsley says: "I grudge that epithet of secular to any matter whatsoever. But I do more; I deny it to anything which God has made, even to the tiniest of insects, the most insignificant atom of dust. To those who believe in God and try to see all things in God, the most minute natural

phenomenon cannot be secular. It must be divine; I say deliberately, divine; and I can use no less lofty word. The grain of dust is a thought of God; God's power made it; God's wisdom gave it whatsoever properties or qualities it may possess; God's providence has put it in the place where it now is. The grain of dust can no more go from God's presence or flee from God's Spirit than you or I can. If it go up to the physical heavens and float (as it actually does) far above the clouds, whither the Alpine snow peaks do not rise, even there it will be obeying physical laws which we hastily term laws of nature, but which are really laws of God; and if it go down into the physical abyss, and be buried fathoms, miles, below the surface, and become an atom of some rock still in the process of consolidation, has it escaped from God? . . . Is it not there obeying physical laws of pressure, heat, crystallization and so forth which are laws of God? If we but look at things as they really are, as the expression of God's mind concerning the universe, we shall call no study secular." Such is the testimony of Kingsley. But he might be biased in favor of religion. He might try unduly to make all study but the handmaid of piety. We shall, therefore, give the testimony of one who cannot be charged with an undue bias toward religion. He says, "True science and true religion are twin sisters, and the separation of either from the other is sure to prove the death of both. Science prospers in exact proportion as it is religious; and religion flourishes in exact proportion to the scientific depth and firmness of its basis. The great deeds of philosophers have been less the fruit of their intellect than of the direction of that intellect by an eminently religious turn of mind. Truth has yielded herself rather to their patience, their love, their single-heartedness, and their self-denial, than to their logical acumen." What an orthodox ring these words have! How eminently religious is their tone! How they thrill the heart and increase our reverence for both science and religion! Yet these are the words of Huxley, and are endorsed by Spencer. Surely, in the mouths of independent and unbiased witnesses we have unmis-

takable testimony to the fact that a liberal education is eminently helpful to true religion.

Nor is this all, liberal education gives dignity to the person—a kind of moral and spiritual value for which we can find no equivalent. The man of cultivated intellect is thereby made more of a man. In every branch of liberal study we are trying to think God's thoughts after Him. This elevates the nature. It gives a dignity to the soul which writes itself on form and face.

Liberal education, then, viewed from any and every standpoint, is possessed of worth. This worth the world is slowly but surely learning to recognize. This worth the world can never over-estimate. Perhaps it can never be fully estimated except by Him who has said, "that the soul be without knowledge is not good," and, "take fast hold of instruction; let her not go; keep her; for she is thy life." But here a question of great importance rises. How can we acquire this broad and deep culture? Never had humanity such facilities for acquiring a thorough education as are at the disposal of the present generation. All the generations of the past have lived for us. Every thinker who ever wore out his life in search after the true, the useful, and the good, toiled for us. Thanks to the printing press, the best thought of the past and of the present is within our reach. But books are cold. Sometimes they are misty and sometimes they seem to weave a tangled web. How often we wish we could question the author. We need the direction, the inspiration, and the general assistance which come from contact with living men who know and can impart their knowledge. We need contact with men who love truth above everything and can inspire us with that love; who revere the good and can inspire us with that reverence. We need contact with men who will, by instruction and example, build up our entire manhood. All this we certainly have at Victoria University. We have great help also from the sympathy of other minds like our own hungering after knowledge. But even when we possess these helps, and when the helps are of the

highest order, they are but helps. All education is in the truest sense self-education. The man who would have a liberal education must intensely think at every step. But intense thinking, concentrated attention, persevering effort, when wisely directed will finally succeed. Nothing but steady, thoughtful work can succeed. *Cramming* may at times succeed as a means to passing examinations, and it is marvellous how it does succeed. A few weeks ago I met a student of one of our Canadian universities who told me he read the pass physics in three days. He then devoted his attention to old examination papers, went up to examination, and passed. That could not have been done at Victoria. So successful has this *cramming* been, even at universities of note, that a Cambridge private tutor said concerning one of his pupils: "If so-and-so did not think so much he might do very well." But so-and-so continued to think and was beaten on examination. But he still continued to think, and we are informed that he outstripped all his contemporaries in scientific reputation. *Cramming* makes superficial men. Earnest, honest, persevering effort makes thorough men. This application should not end when the student graduates. He should regard his education as but in its initial stages. He should plod on his upward way from Alpine height to Alpine height, till he reaches a point where he can say he does not walk in the footsteps of another, but is left alone with God. I cannot better close this address than by placing before you the thoughts of some earnest and honest men, as to the spirit in which the student should prosecute his work. "The student should question everything. He should accept no doctrine either from himself or others without a rigid scrutiny by negative criticism. He should let no fallacy, or incoherence, or confusion of thought step by unperceived. He should insist on having the meaning of a word clearly understood before using it, and the meaning of a proposition before assenting to it." He should consider well what his intellectual powers and defects are, and how he may develop the one and correct the other. He should choose those studies which will develop his

powers and correct his errors, though their prosecution may tax his energies to the very utmost. He should despise merely getting on and passing rivals in comparison with real mental development. He should desire slow but permanent results rather than those which are immediate but fleeting. He should struggle above everything to be self-knowing and self-governing.

"Would'st shape a noble life? Then cast
No backward glances on the past:
And though somewhat be lost and gone,
Yet do thou act as one new-born,
What each day needs, that shalt thou ask;
Each day will set its proper task.
Give others' work just share of praise;
Not of thine own the merits raise.
Beware no fellow-man thou hate;
And so in God's hands leave thy fate."

ADDRESS BY W. W. ANDREWS.

MR. CHAIRMAN, LADIES AND GENTLEMEN,—I have but one fault to find with the address to which we have just listened, and that a supreme one—it is too orthodox—that is, too fully in accord with my own views, to be easily discussed.

With regard to the noble definition of liberal education given by our President, it may be noticed that it is ideal rather than practical; but it is practical because it is ideal. That certain furnishing of the memory, that culture of the natural powers which results in nimbleness of thought and delicacy of feeling, and that beauty and strength of expression which fulfil the common idea of liberal education, is something very different from that which results in a power of thought, keenness of insight, depths of purity of feeling, and nobility of purpose considerably in advance of the age. Nations or individuals, who have set that ideal before them will realize the best that is in them, and, according to their measure, will be world-lifters. They will feel the "heft" of the evil of their age, and though they may sink beneath the burden as the Noblest sank, and though their lives may seem to end in utter failure, the world will swing in higher levels because they have lived. The men

who have in any way realized this ideal are very few. They are the lonely men in the world's history, who stand solemnly apart like the mountain summits, and "commune only with God when He visits their terrible solitudes."

It is useless to talk of such education being an ally of religion. Religion is a part of it by definition; and certainly it is a part of religion. That depth and purity of feeling, that nobleness of purpose spoken of, must be born of that elevation of soul, which we call worship. It may be hero worship, nature worship, worship of a personal God, or worship of the good, the beautiful, and the true. The soul bows somewhere. A soul, in which these noble graces are enshrined, may adopt views which are alien to Christianity as a theology, but underneath the words of antagonism it reaches forth and grasps the core of Christianity as a life. Religion will never die while such education lives.

The address spoke of the power which such an education gave over nature and over men. I wish to emphasize the fact that this increased power implies increased responsibility and multiplied obligations. The scholar has a great deal to do if he does his duty.

The educated man has been sneered at as impracticable, visionary, and cowardly, as unfit to lead the world in reform or to hold it in check with a manly rein. He has been charged with keeping his heart, as well as head, down to books. It has been said that "humanity falls among thieves, and the educated Pharisee and the college Levite pass by on the other side." Is that true? The magnificent names of Moses, Isaiah, Solomon, Paul, Origen, Luther, Huss, Savonarola, college men all of them, stand out in unmistakable protest. John Calvin, John Wycliffe and John Wesley were all Johns and all scholars, and well-beloved leaders of men in moral reform. In a later day a triumvirate of Johns—John Pym in the Commons, John Milton in the Cabinet, and John Hampden in the field, sons of Oxford and Cambridge—fought England's grandest battles on England's soil, and worthily aided another college man, the stern Oliver,

in his great work. The work of these scholars made America possible. The glorious list might further be unrolled if time permitted. The "iron man" of Germany is a college man, and the "grand old man," England's mighty Gladstone, is a man of liberal education, even according to this evening's definition. The constitution of the United States is the work of American scholars; and in the recent conflict on the question of slavery, the college men, Whittier, Longfellow, Holmes, Lowell, Wendell Phillips, Beecher, Parker, Channing, moved in the front lines. The world can afford to part with many noble things before the work of its scholars. Let every would-be scholar burn with high ambitions at the thought of the natural leadership which belongs to his class. As in the days of Grecian games and glory, it is the men with the lighted torches who win the race.

Never was there a time when the necessity of the world demanded so much of its college men as it does to-day. If we are to do as well as the school-craftsmen of other days we must do better. We have greater advantages, grander opportunities, and multiplied obligations. Our obligations to this present age are imperious and unavoidable. We stand absolutely duty-bound. He will ever be the greatest man who sees most clearly the needs of his age and how to meet them. To-day, when universal, or almost universal, suffrage is becoming a fact everywhere, when the distance between the very rich and the very poor is increasing, when the vast aggregations of the people into cities is intensifying the struggle for wealth or life, when the filling up of our prairies promises to repeat upon this new continent many of the hard conditions of the old, when the man who carries the hod has a brain alive with projects of social reform and a heart beating bitterly against the hard conditions of modern life, when vast questions which touch the very core of society, such as the just relations of labor and capital, the distribution of land, the towering power of corporate wealth, have become the burning questions of our times; when our race is conquering the world, and the unfortunate the world

over are our care, it will never do for the scholarship of the world to withdraw in affected delicacy of culture from the consideration of the world's hard, rough problems till the fury of the oppressed demands justice and compels attention. Not in the terror of the storm can these most difficult questions be solved.

We do not finish our education at graduation. When a youth receives the degree Baccalaureus Artium he has matriculated into the grander college of real life, where, by the consecration of his Alma Mater, he is expected to proceed to the degree Magister Beneficiorum—master of good deeds. A man's education—and a liberal education is never finished—is in the use he makes of his powers. How can a scholar live better than by yielding to that solicitation which to the true man must be all-powerful, the call of the necessities of his age? Let him keep "touch" with his times and think and feel for the present and the future. Let his brain be vexed with the problems of the hour. The tremendous issues which now hang upon these make it impossible for the college man to leave their settlement to the uneducated and the passionate, without being untrue to the cause of humanity.

We have become woefully practical in this age, but in the progress of social and intellectual evolution we are becoming practical along higher lines. I believe the days of the glorification of physical science have passed by. The physical sciences can lose none of their importance; but as a human being is of more importance than a geological formation, and a human sorrow a grander phenomenon than a chemical reaction, so the sciences which deal with social and moral problems must demand supreme attention. I heard one who has done some work which the world will not willingly let die, say, when speaking of the multitudinous uncertainties of metaphysics and the weakness of the best scientific hypotheses, that "nothing will stand the test but *doing good*."

The world must be led to use practical action. Hardly a Sunday passes without the socialistic flag waving in some of

the cities of the nation south of us. Prairies being filled, cities engulfing the population, the strains between the orders of society becoming more and more intense, united labor realizing its power! We are walking on slumbering volcanoes.

We may be told that the gospel, and not scholarship, is the destined cure for the evils of the world. Undoubtedly. But it will be practical gospel—gospel moulded to wise and Christ-like applications by a consecrated scholarship. Preaching alone will not do. There must be hard thinking and noble doing. It was gospel that freed the slave, but gospel in the form of rifle-bullets and swamp-angels. The roar of cannons and the tramp of armed men formed the bass, and the shrieks of the dying and high-keyed bugle blasts the treble of that awful anthem to which the slaves marched to liberty. It may be that we may learn sufficient seriousness to apply the gospel to the evils of our times when we have listened to a few more sermons from that stern young preacher, recently licensed by the Church of Old Abuses, the Rev. John Dynamite, D.D.

The leadership of educated men should take the form of independence in judgment and sentiment. This is especially needful in the consideration of political questions. Intellect should ever keep itself above mob law. It is the business of brain to start the winds or breast them. *Vox populi, vox Dei.* Often it is more true, *Vox populi, vox diaboli.* Even when the popular instinct is right the leadership of scholarship is needed to guide the impulses. Impetuous, dauntless, revolutionary Garibaldi was the embodiment of the sentiment of young Italy, but it was the cultured Cavour who moulded it into a nation. When the tide of popular feeling sets in a wrong direction, it is for the scholar to have such a hold upon the eternal principles of right, of national progress and permanence, as illustrated by the past, that he can stand calm and unshaken.

> Though round his base the rolling clouds are spread,
> Eternal sunshine settles on his head.

Let him form his own judgment and speak it. Wisdom does not increase with the count of heads. "A crowd is never so

wise as the wisest man in it." Speak out then and fear not. Servility to a majority is as degrading as servility to a Theebaw. The men who have changed the world have disagreed with it. Between ignorant desire of change and ignorant opposition to change, stand unmindful of aught but the interests of thy fellows.

Another element scholarship should infuse into the world is patience. Work and wait. The good comes slowly. The hands of every future are full of rewards long held back, of promises unredeemed as yet. The good comes surely. And this the scholar should know.

Our conclusion is this: The use of the gifts of culture under the guidance of a sincere enthusiasm of humanity, with the hard and anxious thought, the patience, the independence, and the self-devotion which that implies, is the best post-graduate course possible. Still it is true, and shall ever be, that the law of sacrifice is the supreme law for getting the most out of life and out of ourselves. Gifts are never so fruitful as when used with noble aims.

ADDRESS BY J. D. ELLIS.

In all discussions in our Society we carefully guard against criticising an essay for the sake of fault-finding. If we can raise no objection we are quite willing to praise.

In the address to which we have listened I think all will acknowledge there is little to which exception can be taken. It is true there were points which *I* might have emphasised more strongly, there are points which *I* might have taken up, that were not touched upon. But criticism, to be fair, should be engaged with what has been said instead of what has not been said, unless the part omitted is considered of more importance than that touched upon, or unless there was ample time to have taken up more. Here, however, the time was fully occupied and the ground so widely covered that it embraced all the most important material. It remains for me, then, merely to lay particular stress upon what I consider the important parts of the essay.

I agree thoroughly with the idea that education consists not so much in the acquirement of facts as in training the mind. The statement, "it is necessary to think intensely at every step of life," seems to me to be the foundation of a true system of education. Deep thinking is necessary to the application of all knowledge. It is this alone that makes men practical. We encounter instances in every-day life of men who have been successful students, have taken high degrees and who have done it fairly, without cramming, and yet in after life they are failures. The world says "they know enough but they are not practical." The fact is they have not done intense thinking over all they learnt. Of what use is it that an astronomer can locate the orbs or understand the music of the spheres unless he will put his mind to work and deduce laws and draw inferences that will lead man to a higher knowledge of himself and his Creator? Of what use is it that the scientist know the symbols, combining weights, etc, of all the elements unless he can apply that knowledge in such a way that it will free humanity from some of its burdens and make life happier?

Of what use is it that the theologian can travel back through past centuries and dead languages till he can trace the rise and development of every religious dogma, unless he will think around it and through it until he can settle that which is true and worthy and give it to the world? The mere collection of these items of knowledge are useless unless thought over and assimilated to the man's nature till they become a part of his being. This, I take it, has been the greatest difference between inventors and those not so famed. The men who have given the new ideas to the world were not always the men of greatest knowledge. They were those who tested each fact acquired, asking why thus and what effect has it? Does it interest me, is it of any consequence? It has been by looking all around every item of knowledge that men have used it for the world's good. The difference is that between a reservoir and a fountain—the one holds everything that comes within its reach, the other scatters its wealth for the benefit of mankind.

Another point of great interest to-day is this matter of specialization. I should like to have seen it dealt with. Of course we must admit there is a way in which this feature may be introduced into education with good effect. But there is a possibility, and I think a tendency, to-day to carry it to an extreme. I think boys frequently limit their sphere too soon and too much. How can the youth at matriculation know in what line he is most needed, and will best succeed? The various subjects lectured on by a professor might be likened to dishes of viands, of which each boy is expected to partake. Now it is not for each simply to note the effect any dish may have on his palate or feelings, and from this to choose a life food. He must thoroughly digest, and by long observation and experience see how it affects his constitution, and then, but not till then, can he say which food shall be his life support. Similarly a student must have a fairly wide and thorough education before he can specialize with justice to himself. I think, understood in its proper significance, the statement "Know something of everything and everything of something," contains a great truth. Of course, I do no mean by this that a man shall know something of every branch of knowledge known in the world, but I do claim that in the ordinary subjects of the curriculum a man should be well rounded before he limits himself to one. The different branches of education are connected with and run into each other. A man must have a fair, general idea of them all before he can know one. A professor lecturing on theology cannot avoid questions from science meeting him at every step. If he knows nothing of that subject he is not proficient in theology. The fact is, there are many who, with no broad foundation, have centred their efforts in one small groove, seeing nothing, and able to talk of nothing outside that narrow line. While at college they are called specialists; in the world they are dubbed "cranks." Men of *one* subject, who have become famous, have always been the men who knew considerable of almost every other important subject. I would like to say something of the self-satisfaction resulting from such an education, but my time does not permit.

ADDRESS BY E. H. KOYL.

WE have listened to an address which set forth plainly and strongly the characteristics and the advantages of a liberal education. I do not wish to take exception to any of the positions therein held, though I must run counter to remarks made by one of the after-speakers.

The address gave what has been called "a noble definition of liberal education," making it embrace all advanced languages, ancient and modern, a thorough knowledge of our mother tongue, mathematics, philosophy, and science—physical, moral and mental. I ask, is such an education possible, and if so, is it practical?

It would doubtless be a very desirable thing for the cultured and leading men of earth to be thoroughly at home in the noble language of Homer, Plato and Demosthenes—the language alike of philosophy and of Christianity; that they should perfectly know the language of Cicero and of Cæsar, that they be familiar with the speech of Goethe and Schiller, and that often they should stroll the intellectual walks of pleasant France. And not only so, but they should be equally well acquainted with the Oriental languages, and read alike the sacred books of India, of Persia, and of Judea; and especially, if they be Englishmen, that they understand from root to branch, "from turret to foundation stone," that Anglo-Saxon tongue which has crystallized and embalmed forever—

> "Shakspeare's deep and wondrous verse,
> And Milton's loftier mind,
> With Alfred's laws, and Newton's lore."

It would be desirable for them to have a thorough training in mathematics, science, and philosophy, that they could follow the stars in their courses, count the vibrations of a molecule, mark the play of man's muscles, or analyze the powers of his mind.

All these things are beautiful; all these are honorable; all these are worthy to be the goal of ambition, and if man could

live to the age of Methuselah they might be attained unto. But the years of man's life are "threescore and ten; and if by reason of strength they be fourscore years," yet, if in them he must acquire an education such as that, "yet is their strength labor and sorrow." I yield full honor to the noble intellectual powers of man, to the work he can do, the knowledge he can acquire, the culture he can receive, the mysteries he can solve during his short lifetime here; but I hold that a training embracing anything like a complete knowledge of all those branches,—that such an education, when presented as a model before the great mass of humanity—yes, before the great majority of cultured and leisurely men—is a utopian scheme. It is impossible. Is it then practical? Whether is it better, that man seek to know all things, or that having laid a good foundation by general studies he then pursue some particular branch of learning? Whether is it better, that man spread himself like a green vine over the sod, grasping here, grasping there, grasping everywhere,—firmly rooted nowhere,—or that like the stalwart forest king he send down his roots and spread forth his branches drawing nourishment from every inch of air and ground in his particular environment, lifting his head as one who knows whereon he stands, and courting the criticism of the storms?

A great man said not long since, "Education is intended neither for amusement, for fame, nor for profit, but to know God and glorify Him in heaven hereafter."

I venture to question the truth of the negative part of that statement, and to say that education is intended to be the great source of amusement, and is the great force that must revolutionize many of the amusements of this day, and give the substantial and the elevating in lieu of the fading and degrading. I assert that so far as fame is legitimate at all, education furnishes the broadest fields and the brightest laurels of honor. I assert that education is especially intended for profit,—profit to ourselves, profit to our fellow-men, profit here, profit hereafter. There is a rich and undying pleasure and satisfaction

in the pursuit of knowledge, but its greatest blessing,—that which makes wisdom "the principal thing,"—is its usefulness,—the extra chance it gives man to do good unto others, to redeem the minutes and consecrate the hours. And to this end, it seems to me, a devoted study of some one line of truth tends much more strongly than an education which is spread over every worthy branch. I will grant that the man who gives his attention to a great many lines of thought, who seeks for truth in every department of knowledge, develops his nature to a perfection which nothing else could enable him to reach, and I will add my belief that in the great realm of the hereafter there will be a satisfaction for that nature suited to its development,—that there as here such an one will feel the throbbings and impulses of a noble nature. Without controversy, there is a prophetic beauty in those words which came as a sigh of relief to the burdened heart of Tennyson as he mourned for the highly cultured Hallam:

> "And doubtless unto him is given
> A life that bears immortal fruit,
> In such great offices as suit
> The full-grown energies of heaven."

But at what price does man obtain this broadened and balanced nature? At the price of a part, at least, of his usefulness. True, he may be useful, very useful, but not so useful as if he had laid a firm foundation and then given his attention to one style of building;—as if he had taken a fair education—a knowledge of all these branches sufficient to make him intelligent and liberal minded—and then have become a specialist in some one branch. No matter how liberal his education may have been, no matter how wide or how thorough, he cannot know as much of any one department, he is not as good an authority on the questions arising in relation to any one subject, as if he had given his life's work to that department and made that subject a special study, stopping to acquire other knowledge only as it threw a side light upon, or was requisite to his work.

By taking this latter course a man may not become as intellectually symmetrical, but he will be more useful to his fellow-men. He may not be as good a man on whom to confer an honorary degree, but he will be a better man on whom to spend your money. He may not have as much charity for the particular beliefs of his fellow-men, but he will be able to do stricter justice to some of the rights of humanity. He may lose the heritage of a fully developed nature, but he will gain the reward of a deeper devotion.

In closing I wish to emphasize a position taken by the speaker. He marked the close relationship existing between, and the mutual aid of education and religion. Liberal education must be Christian education. Christian education sheds light upon the intellectual world and gives a fresh radiance to truth. So-called Christian education has not always been liberal. But unless the great principles of morality, of justice and mercy are taught,—unless these are inculcated, the principles of individual responsibility and individual integrity, which are alike the ethics of the dust, the ethics of the conscience and the ethics of the Bible, then education is incomplete, is illiberal, and can only dwarf and warp man's nature. To use the words of Archdeacon Farrar, "Our education can never be perfect unless like the ancient temples it is lighted from the top."

Of a true university it has been well said by one in whose words I close, that "the retreat of the Muses purifies, humanizes, exalts and leads to God" May our university "be like an angel standing in the sun, radiating long streams of mingled earthly and heavenly light to distant points and remote regions."

MR. ELLIOTT'S REPLY.

MR. CHAIRMAN, LADIES AND GENTLEMEN,—The gentlemen to whose eloquence we have listened with rapt attention have not criticised my address severely. They have, however, as I think, fallen into some errors. I will therefore criticise them. Mr. Koyl finds fault with my definition of education as being

too all-embracing. Had he given a little more attention to the qualifying phrase, "as far as practicable," placed in connection with the study of the languages of the most advanced peoples, he would not have needed to expatiate so eloquently on the impossibility of knowing everything. There is nothing much more dangerous than getting a superficial knowledge of anything and then venturing to criticise what we were not at the pains to understand. This Mr. Koyl has done.

Mr. Andrews suggests that the gospel of dynamite will be needed to set the world right. Education should render this unnecessary. When men are taught that the prosperity of others is really in some degree their own prosperity, that general progress will shower its blessings on them even without their own effort, that the world is a brotherhood in which the good of each is interwoven with the good of the whole, there will be no need of dynamite as gospel. What we do need is thorough instruction in the relation of man to man, and of each individual to the whole. The time has arrived when all our colleges should teach all their students political economy. What is the good of an institution of learning which does not teach men how to grapple with the problems they are sure to meet when they leave its halls? Mr. Andrews thinks mental science a useless study. Had he said it is one of the most important he would have been nearer the truth. Mental science deals with facts of the greatest importance to humanity. Is there a God? Is the human soul immortal? Is the human will free? If so, to what extent free? These are questions of no small importance to mankind. Without closest study we cannot hope to understand ourselves. Just a word on specialization. I believe it should not begin till after graduation. The foundation then laid is neither too deep nor too broad. Every study helps every other, and we shall find ourselves at a great disadvantage should we specialize too early.

RELIGION IN COLLEGES AT HOME AND ABROAD.

BY JOSEPH COOK.

BENJAMIN FRANKLIN, whom Thomas Carlyle called the father of all shrewd Americans, and of whom the French love to say that he wrenched the sceptre from tyrants and the lightning from heaven, had during his own life a most searching habit of self-examination in moral things. Even while he was an embassador at Paris he carried with him a little book, ruled in thirteen columns in one direction and in seven in the other, and containing the names of about a dozen virtues in which it was his purpose to make himself, if possible, perfect. He was accustomed at the close of every day, even in the busiest parts of his mercilessly crowded life, to examine his actions and motives, and place against himself marks, black or white, according to the judgment of the innermost moral sense. One of his great maxims was: "Endeavor to keep alive in your soul that little spark of celestial fire called conscience." Very possibly a man of no more historic dignity than Benjamin Franklin—a person who accomplished so little in the world as he—may be much beneath the attention of Freshmen and Sophomores in our universities; but in Boston, with his statue in living and breathing bronze looking down upon us, with the history of his marvellous boyhood enchanting us, as we look back into the colonial era of Massachusetts and Pennsylvania, it is very natural, under the shadow of Harvard University, that a man should wish to have even Freshmen and Sophomores to keep alive the celestial spark called conscience. Keep that spark alive, in spite of extinguishers in the infamous spots of this municipality; keep it alive in spite of extinguishers in false faiths and crude philosophies, and merely semi-Christian convictions as to religious things; keep it alive in spite of all that can be found in class pride and undergraduate giddiness to trample out the fire of devoutness in a young man's soul.

It is said that three bad men give a tone to a regiment. Six bad men will give a tone to almost any college class. With

such great classes as our universities of the first rank now have, it is very uncommon not to find that number of bad men in a class. Under the subtle operation of precedents in college life they may give a lasting taint to many a society organized in their university. A class, a college full of undergraduates is a world in itself; but its members are not selected to match each other in moral matters. A young man who goes into college cringing and ducking, and acts like a poltroon in his first few weeks, in presence of these rough-shod moral misleaders, is very likely to be trampled on through his whole four years. A young man who allows himself to be ridden over by the moral roughs of a college for four years is likely to be ridden over by the moral roughs of professional life, and most especially by those of politics and commerce. He is not likely to have courage to stand erect against the huge vices of time. It is, therefore, of the utmost consequence that a young man entering college should be taught, in the first place, manliness. I have great sympathy with a sentiment I once heard uttered by a distinguished college professor, that if a young man is ruined in college, it is, at least, possible that he is not worth saving. Speaking from the point of view of affairs on this side the grave, this is not too stern a censure. If a young man, after such training as now usually precedes a college course, cannot stand up in college against the ordinary moral temptations of the place, against the sneers of a few dissipated classmates, against the persecution that may be organized against him in his earlier years, because of his moral attitude, then I say that such a young man is probably not worth saving for the great purposes of a courageous public life. We must look upon such men as, in most cases, weaklings and poltroons, and try to create a soul under the ribs of their death by pointing out their cowardice. Some men, I know, are naturally shy and others brave; but to each temperament Providence assigns special weapons of self-protection. The sharp-horned elk in the wilds of Africa has been known to be sometimes a fatal antagonist of a lion. A Dean Stanley, in his preparatory school, used to

kneel down at his bedside in the midst of jeers from all quarters of the great apartment, and sometimes under missiles hurled at him from this corner or that, and offer his prayers as he did aforetime on his father's hearth. A shyer boy, perhaps, never went into a rough public school; but in after life this man exhibited the same bravery to the very end that he manifested as a mere youth. His character in his public career, like that of many another scholar, was formed, in part, by the experience he had of standing up with vigor in defence of his moral ideals when he was in the preparatory school and in college.

In class pride and in mechanical arrangements of students in colleges there is a subtle temptation to make complaisance the rule, even in presence of vice. Young men are arranged alphabetically on the seats of the university class-rooms, and, perhaps, a man of high moral principle sits side by side with a moral leper. Here is a person who is not a fruit of the Tree of Life so much as a husk and a pod, with the sap of youth already drawn out of him by his vices. He is a cinder already and you may sit beside him for four years. Still, of course, you must be courteous. A hero must be a gentleman; but a gentle*man* may also be a *gentle*man, and the full height of culture is obtained only by emphasizing both parts of this word. You must do what decency requires; but you need not invite that man to your room, you need not form any social affiliations with him. You may treat him with courteous good-humor here and there, possibly you may have an opportunity to say a serious word to him more than once before your quadrennial shall end. Marvellous opportunity this is for you to rescue a brand from the burning. Unpopular language this is in universities, you say. I have seen too many college brands burned to thin ashes not to be willing to use this language with entire frankness face to face with the haughtiest university on earth. I am some years out of the university, and I tell young men who are now in college that, ten years after they are out of it, if they will call the roll of the dissipated that they knew in their quadrennial, they will usually find

seven out of ten of them approaching early graves. I do not know one man who had the reputation of a dissipated person in my college course that now has a position of any honor in a profession. I do not know one who has the promise of such a position who in his college life was among the wild persons in the class.

Ten years of self-support show of what substance young men in college were really made. It is possible that a wealthy man's son in college may be dissipated, and yet live a smooth outer life; but let him, after he is out of college, be forced to take care of himself; let him begin to work in some serious business, let him enter an exacting profession, and very soon his fibre shows that it has not much firmness, and is disintoned, if not melted, by his vices; his will is weak, even if his body has not been severely injured; and the result in most cases is that he stumbles in his first efforts, and, stumbling there, he stumbles more or less in his second and competition passes him by. In the rough contest of professional life he is very soon under foot and forgotten. I am not unmindful of the fact that some dissipated men have been saved by an exacting profession, and some by a happy marriage, which no dissipated man deserves; but these are exceptional cases. You must not look forward to any such issue of your dallying with vice. It is, indeed, possible that, as you grow older, you will see that the apples of Sodom are full of dust and ashes, that they are not good food for rational souls, and mere ambition may lift you into something like honor, if not religious principle. It is possible that love may take up the harp of your life, and

> Smite on all the chords with might,
> Smite the chord of self, which, trembling,
> May in music pass from sight.

Tennyson says this is what happens with that central strand of the worst part of our nature, selfishness. Perhaps this is what will happen also with sensuality, and with indolence, and with all those loathsome habits which you have hugged to your bosom in your dissipated college course. But the probability

is that these vipers will continue to feed on your heart's core till you can pass into your grave. Shake off from the very first, therefore, I say to the young men of honor in college, all company that is not respectable. Daniel Webster read through the life of Lord Byron, and said that there was not a single trait in Byron's earlier character that he could respect, and that, therefore, he cared for no close association with the soul of Byron, simply because he was not respectable. He admired his genius, but remembered that in the long course, under the operation of the law of the survival of the fittest, he comes nearest to success who is nearest to God.

All this, you say, is appealing to selfish considerations. Yes; but I have been speaking to Freshmen and Sophomores. I will rise now to the higher classes, and say a word from a loftier outlook. When a man becomes a Junior or Senior he begins to think very seriously of what profession he will enter.

By what methods may a man secure the right moral management of his life in college?

1. Settlement of a plan for success in this world and the next.

2. Anticipation of the demands of your own intellectual and spiritual growth.

The next world is not visible from some of the heights of youth, but I hope most young men have moments in which there are glimpses of the terminal range of life, and in which they think of the ocean behind the Andes to which they must go down when they cross the summit of death. What I want young men to do is to cultivate assiduously the wisdom these moments give them. Take your loftiest moods, and make them the guiding constellations of your lives. One mischief among young men is that they do not anticipate their own growth. Have not you outgrown the love of rocking-horses and kites and candies, and are you not likely to outgrow many of your present tastes? Remember what you will be when, at 40 years of age, or 35, or 30, you are in the midst of a crowded professional life. Remember what you will want when you have a fireside of your own.

3. Anticipation of marriage.

Take into view the fact that he who dips himself in the seas of ink ceases to be marriageable. A most delicate theme, you say, to mention to university students. Would God that it were mentioned somewhere every week in the ears of young men in colleges! Would God that the future fire of the hearthstone could lie as a living coal on every tempted heart in our circles of young men in university towns! When I left Phillips Academy, a great professor in Andover Theological Seminary said, in a farewell address to my class, and the remark was full of an orthodoxy which I hope will be found at Andover for centuries to come, in all its old earnestness and fire: "In view of the temptations of a college life, it would be well for every young man to have laid on his heart a living red-hot coal of God Almighty's wrath." That sentence burned me through. Here and now I will not say anything quite as startling, but I say: Put upon the heart of young men large gatherings of coals out of their anticipated future family fires. Take the burning incense off the marriage altar, and put it, while yet you are in college, on your heart, and through the ascending clouds of that holy oblation vice will reveal itself to you as the unspeakably odious thing it is.

4. High intellectual aims, unflinchingly pursued in face of every discouragement.

If a young man is tempted in college, let him aim to be first in his class, and very soon temptation will lose its attractiveness. My conviction is that most young men underrate the extent of self-improvement they are capable of achieving, under the permanent pressure of high aims, or the necessity of a profession.

5. Association of the intimate kind only with respectable fellow-students, no matter how long the period of college acquaintanceship, nor what class sentiment may say.

6. Devout cultivation of all the affections, sanctities, honors and blisses of home life.

In 1830 there were only 4,021 college students in the United

States; now there are 62,435. It is exceedingly significant that for fifty years the number of our college students has increased more than twice as fast as that of the population. (See "American Almanac for 1883," p. 47.) What aspiration this one fact reveals in the American masses; what heroic self-help on the part of many young men; what generous assistance from parents of large incomes; what pathetic self-denial in the case of many a father and mother of limited or narrow means, but resolved to lift their son to an opportunity better than their own! Webster invoked once a curse upon himself if he ever forgot what his father did for his education. Carlyle felt through his whole life that he was standing on his father's shoulders. Yet men who are not self-made remember who made them. Accursed is every thing that brings a cloud or even a hate between a young man and father and mother, brother or sister. Let students saturate their individual secret college lives with home life, and home life with college life.

7. Intellectual and moral nearness to the greatest and best men, and persistent aloofness from the weakest and worst, in college faculties.

It, perhaps, ill becomes me to speak of the living among our revered college instructors, but I cannot resist the temptation to mention three or four men who stand as watch-towers on the stormy coasts of university careers—Mark Hopkins, [applause], President Woolsey, James M'Cosh, Thomas Arnold. Time fails me to glance into the careers of these men, nor need I do so, as they are lights on hills. I might mention many others; but I happen to know that, at least, twelve hundred students have been graduated from Princeton College since President M'Cosh became the head of the institution, and that only six or eight of them have gone into the world believing nothing. [Applause.] President M'Cosh is a philosopher of most eminent rank, abreast of modern science, and almost monthly publishing something that leads thought in most learned circles, here and abroad. What does he do? In spite of his learning, in spite of the dignity of his office, in spite of

the majesty of his character—or, rather, on account of it—he is accustomed to take young men to his study for personal conversation on religion and for prayer. Very few sceptical and dissipated young men leave Princeton without knowing what the President's private intercourse is and its relations to these high matters. I have read a statement of President M'Cosh concerning four young men who were particularly given to scepticism, and who refused, even under these influences, to be brought into anything like what he would call a reasonable mood. He is not a sectarian. If he thought he had a drop of sectarian blood in his veins, President M'Cosh would be glad to open them and let it out. [Applause.] But he believes in clear ideas, he believes in spiritual purposes, he believes in conscience, he believes in natural religion and revealed, and he allows his light to shine to the thirty-two points of the compass. Sixteen years minister with a colleague in a Scottish Church of 1,400 communicants, sixteen years professor of philosophy at Belfast University, now nearly sixteen years President of Princeton College, this citizen of two hemispheres has to-day a voluntary class of some 300 students in philosophy, and at the same time is one of the highest authorities in the world of advanced theological thought. Those four young men, although they left college nearly or quite agnostic, atheistic, or infidel in their general positions, all became Christian believers within ten years, and three of them preachers. [Applause.] May Almighty God multiply in our colleges men like Thomas Arnold, and Mark Hopkins, and President Woolsey, and James M'Cosh, and a starry list of others whom your reverent thoughts will call to mind. With emotions fitly expressed only by a famous poem of Matthew Arnold's, I stood once a long while alone in the stately chapel of Rugby at the side of the marble slab in the floor covering the spot where Thomas Arnold lies at rest until the heavens be no more. A ray of the westering English sun fell upon it in benediction; but seemed to come from the American heavens, so dear is this man's memory to hundreds here who never saw his face. I know not what may

be the horror of a man who feels that he has ruined the physical life of another or poisoned the body; but what ought to be the unspeakable horror of any college professor or president who by his sneers at Christianity poisons a soul? A man who exerts a bad influence from a college chair becomes a block over which young men by scores, and possibly by hundreds, may stumble into moral disaster or a crippled state of soul, which will prevent stalwartness in their public lives, when they are called upon to perform their highest duties. Would God that icebergs in college chairs, sitting there in stately unconcern, could read Tennyson's poem on the temple of culture and the "Palace of Art" with due appreciation. After three years of this isolated pride, Tennyson's soul, according to this poem, fell down in despair, called on God to teach it to pray and to show it the means of deliverance from guilt. These acts are the loftiest pinnacles of culture. Would God that we could have in the Churches at large such a vernal season as to melt all the masses of ice in the frozen altitude of culture and transform them into bursting, perennial, crystalline springs and living, leaping rills on the mountain sides of our universities, flowing down into the lower slopes of education and fertilizing the great valleys with an inundation without ebb, until they pass into the ocean of eternity. [Loud applause.] That is what we want of college professors. Let them be rivers, and not glaciers, even if they are on the stately summits of Harvard. [Laughter and applause.]

Let me defend here the good name of my Alma Mater, for there is not a paving stone nor an elm tree in the grounds of Harvard University, in Cambridge yonder, that is not a treasure to me. Her religious state is vastly better than it was a generation ago—immensely better than it was at the opening of the century. Thirty years ago only nine per cent. of the students of Harvard were professed Christians; to-day the proportion is fifty-two per cent. (The Rev. C. F. Thwing, in *Christian Union*, March 1, 1883. See, also, his excellent volume on "American Colleges," pp. 55–68.) There are little swirls of

reaction now and then in the Harvard College life; but she must not be judged by these, but by her averages of influence. Not that I regard a student there at any time as in a hot-house intended to cause the growth of evangelical piety. (Laughter.) A man who goes through Harvard and stands erect is likely to be able to stand erect afterward. (Applause.) Harvard is either the best or the worst place among our colleges in which to grow Christians, just as the open field is the best or worst place in which to grow a stalwart oak. If the oak yields, it snaps and lies prostrate; but if it stands erect, if it throws out victorious branches to all the buffeting tempests, then, on account of the buffeting, it grows the stronger, and at the last becomes rounded and mighty toward the four corners of the heavens. Its strength has been robbed from the very winds that have assailed it by day and by night. Let a young man thus stand erect in college, and the more stern the conditions of his temptation the stronger he is likely to be at the last.

8. Establishment of the chief points of religious belief.

You cannot study the whole system of theology before you are graduated. But set apart some portion of your time—I do not care if it is half the leisure of every Sunday—for the study of the points on which you are most in doubt, and as to which you most feel your need of confirmation of conviction. Let several hours a week be used for special spiritual education, such as you need. Every man's case differs from the case of every other man in many points. Let every young man go to his best adviser, this college professor or that, and if any college professor, hearing his account of his spiritual temptations, turns upon him and asks simply, with a pagan stare, "What have you been eating? Is not something the matter with your stomach?" turn from that man, shake off the very dust of your feet against him, and remember that the days of paganism have passed with men of clear ideas. It is atrocious to find college professors giving stones when they are asked to give bread. You will find professors to meet your need if you search

for them. There ought to be a pastor in every university, some man of eminent native endowments, of unsullied splendor of character, of unstinted largeness of intellectual acquisitions, of burning spiritual zeal, and a broad, balanced love of progress. Let such a person stand before young men, and he will draw them as the magnet draws a needle. It cannot but be that he will produce in them the image of God, if only he is himself rightly intoxicated with God. Of what are our trustees dreaming, that they leave many colleges and schools, which are the most important parishes in New England, almost wholly without pastors of adequate equipment?

9. Let young men seek balance of culture. Here is the human face. If I were to develop one feature in the countenance at the expense of another, I should be doing very much what is done in many college courses. It is the balance of features that makes the expression of the human face. The operation of an exclusively secular college course is to enlarge the eyes and lips, and sometimes the chin (laughter), and leave the other features unchanged. This is the style of human being that is apt to be produced by a merely scientific and classical, and not distinctively religious university—a truncated, topless moral one—the loftiest thing in him not yet developed. Let young men remember that it is symmetry of development that secures strength. There is nothing much worse in the educational hazards of our time than a tendency to drill men out of all symmetry, into mere specialists. A man is all eye and ear, and has no lips; or, all mouth, and has no regularity of forehead; or, in some case of an eccentric infidel, he has chin and lips and not much else. (Laughter.) This effort of our time to make men specialists is a glorious and necessary one, indeed; but it has its dangers. The fragmentariness and narrowness of the culture of our average specialists are not enough emphasized. I hold that any college that does not seek to give its students moral training, in some such sense as to lift them up to the really highest ideals of religious culture, is a one-sided affair, and should be criticised in the name

of culture. Rawness of thought in ethical and religious matters characterizes the graduates of secular governmental universities in India and Japan to such a degree that the crudest speculations of the agnostic and materialistic school are often received as the maturest wisdom of the Occident. The native reformers of Asia, under the leadership of Chunder Sen, are protesting with not a little success against the complete secularization of the courses of university studies in India.

10. Scipio Africanus should give even pagan students something of his wisdom. He never began any public enterprise of importance without first going to the Capitol, and, sitting some time alone, receiving, as he thought, communications from the gods.

This pagan, one of the very noblest of the Romans, conqueror of Hannibal, his daughter the mother of the Gracchi. I keep a marble antique bust of Scipio Africanus in my parlor, and every day it is an inspiration to me—the scar on the forehead, the massiveness of the head, the uprightness of the look, the wary, searching, terrible Roman courage of the man! Nothing apologetic or craven about him, nothing unbalanced; really, a person who, as I believe, would have been a Christian, and even a devout student of its innermost mysteries, if Christianity had been presented to him. Mr. Emerson objected strenuously to the abolition of devotional public exercises in colleges. Hegel called prayer the highest act of the human spirit. Secret prayer, morning devotions, an hour with God every day, the putting of the human hand into the hands of the Almighty, as both Saviour and Lord—these are the sure means of success in this life and in the next. Let us put the hands of young men in American colleges, in English and German, in Indian, in Chinese, in Japanese, and Australian, into the palms that were pierced; let us unhesitatingly give the leadership of education in the world to Christ our Lord, and so bring the whole earth into His bosom. (Loud applause.)

EDITORIAL.

"KOSMOS" AS A QUARTERLY.—We take great pleasure in greeting all our friends, both old and new, from the pages of a Quarterly. Our visits will be less frequent, but, we trust, more valuable and not less pleasant. It is our purpose to win KOSMOS a name for strong, broad, original and fair-minded thinking. We will not be afraid even of a touch of radicalism, so it be free from dogmatism and narrowness. We will look upon all theories and hypotheses but as tents of a night, to be stricken whenever "Truth puts the bugle to her lips to sound the march to clearer heights and loftier camping grounds." By the introduction in a larger degree of the personal element and the feature of discussions we hope to add interest, variety and breadth to the thought presented. The purpose and work of the Quarterly may be expected to develop with succeeding numbers. We invite the co-operation of friends in bringing to the pages of KOSMOS the strong, the fresh and the true.

THE METAPHYSICAL SOCIETY.—We call attention to the work and *personnel* of this remarkable society. It is a possibility of the nineteenth century alone, that men representing such diverse schools of thought could meet for so many years in friendly discussion on the questions at issue between them. Our respect for the men must be vastly increased, and with much better humor we ought to be able to turn the pages of those, who deal most stalwart blows against our most cherished conclusions. The following note, written by Mr. Knowles, editor *Nineteenth Century*, who first published this debate on "The Uniformity of Nature," introduces us to the distinguished members of this Society.

"A REMINISCENCE.

"In the autumn of 1868, Mr. Tennyson and the Rev. Charles Pritchard—Savilian Professor of Astronomy—were guests together in my house.

"A good deal of talk arose on speculative subjects, especially

theology, and in the course of it the idea was suggested of founding a Theological Society, to discuss such questions after the manner and with the freedom of an ordinary scientific society.

"I volunteered to endeavor to bring such a body together if Mr. Tennyson and Mr. Pritchard would promise to belong to it, and I then consulted other friends, beginning with Dean Stanley, Dean Alford, Archbishop Manning, the Rev. James Martineau, the Bishop of Gloucester and Bristol, Dr. Ward of the *Dublin Review*, Mr. R. H. Hutton of the *Spectator*, and one or two more, finding them all willing to join. I next went to 'the opposition,' and, explaining our plan, found Professor Huxley, Professor Tyndall, Mr. Froude, Mr. Walter Bagehot, Sir John Lubbock, and others equally ready to co-operate.

"The originally intended name of Theological Society was dropped in favor of 'Metaphysical Society,' under which full discussion of the largest range of topics from all points of view could be better insured, and on the 21st of April, 1869, we held our first meeting at Willis's Rooms.

"I remember Mr. Froude—who was among our first members—saying, that if we hung together for twelve months it would be one of the most remarkable facts in history. But we 'hung together' for nearly twelve years, meeting once a month, usually at an hotel, where, after dining together, a paper was read by some member, and afterwards discussed. Mr. Tennyson's remark at an early meeting seemed always borne in mind—that 'modern science ought, at any rate, to have taught us one thing—how to separate light from heat.'

"When the list of members and the character of the subjects discussed are considered, many will agree that it is matter for congratulation, and a pleasant sign of the times, that such a society should have lived its full life in London in entire harmony. It came to an end because, after twelve years of debating, there seemed little to be said which had not already been repeated more than once. The members were as follows:—

"Mr. Tennyson, Mr. Gladstone, The Duke of Argyll, Dean

Stanley, Archbishop Manning, The Bishop of St. David's, The Archbishop of York, Prof. Huxley, The Bishop of Peterborough, Prof. Tyndall, Mr. Frederic Harrison, Lord Selborne, Prof. Clifford, Father Dalgairns, Sir James Stephen, Dr. Ward, The Bishop of Gloucester and Bristol, Dean Alford, The Dean of St. Paul's, Mr. Ruskin, Mr. Froude, Mr. Grant Duff, Mr. Robert Lowe, Rev. Prof. Maurice, Rev. Prof. Pritchard, Prof. Robertson, Sir Alexander Grant, Lord Arthur Russell, Rev. Canon Barry, Rev. James Martineau, Prof. Seeley, Mr. Walter Bagehot, Sir John Lubbock, Rev. Mark Pattison, Dr. Carpenter, Prof. Lushington, Mr. Shadworth Hodgson, Dr. Andrew Clark, Mr. Leslie Stephen, Mr. John Morley, Sir William Gull, Dr. Gasquet, Prof. Fraser, Mr. George Grove, Rev. Dr. Mozley, Mr. James Hinton, Prof. Sylvester, Dr. Bucknill, Prof. St. George Mivart, Prof. Barnes Upton, Mr. Henry Sidgwick, Mr. R. H. Hutton, Rev. Robert Clarke, Mr. W. R. Greg, Mr. Matthew Boulton, Mr. Frederick Pollock, Dr. Acland, Hon. Roden Noel, Mr. James Knowles.

"Amongst our Chairmen—appointed annually, but sometimes serving for two years successively—were Sir John Lubbock, Cardinal Manning, Professor Huxley, Mr. Gladstone, Dr. Ward, Dr. Martineau, Lord Selborne, and Lord Arthur Russell.

"The character of the subjects brought forward may be gathered from the titles of some of the papers, and as the discussions were absolutely confidential and unreported, they were almost always of much animation and interest. They suggested to myself (as Hon Sec. to the society) the idea of the 'Modern Symposium' which several times appeared in this review. The following were amongst the papers read before the society:—

"The Theory of Causation.—The Theory of a Soul.—Is God Unknowable?—What is Death?—Will and Responsibility.—The Scientific Basis of Morals.—The Nature and Authority of Miracle.—Has a Frog a Soul?—On the words Nature, Natural, and Supernatural.—The Ethics of Belief.—What is Matter?—The Soul before and after Death.—What is a Lie?—How do we

come by our Knowledge?—The Personality of God.—The Verification of Beliefs.—The Emotion of Conviction.—Memory as an Intuitive Faculty.—The Relation of Will to Thought.—Matter and Force.—The Absolute.—The Nature of Things in Themselves—The Nature of the Moral Principle.—The Evidence of the Miracle of the Resurrection.—The Arguments for a Future Life.—Hospitals for Incurables from a Moral Point of View.—Double Truth.

"The article kindly volunteered by Mr. Hutton was suggested by him, not as a portrait of any actual meeting, but as a reminiscence of the sort of debate which used to go on. Its faithfulness is remarkable, except for the omission of his own valuable part in the discussion."

RELIGION IN COLLEGES.—We publish Joseph Cook's strong prelude in view of the great interest which this subject awakened lately in the religious press of the United States. The day of prayer for colleges and the recent discussion at a meeting of the Nineteenth Century Club, in which Presidents Eliot and McCosh were the prominent figures, have served to bring the question to the front just now. The President of Harvard agrees with the President of Princeton as to the worth of religion as a practical force in college life; they differ on the question of the amount of the legal sanction and official enforcement with which the cause of religion should be upheld,—one advocating perfect freedom and no official recognition, and the other holding that God and Christianity should be recognized and respected. The whole tenor of the press articles has been to show that there has been great improvement in the moral atmosphere of colleges. College barbarisms, such as hazing and practical joking, have been dying out. In the denominational colleges there are a larger proportion of students professed Christians. In 1813 only two or three students at Princeton were members of the Church. To-day there are 435 students in attendance, and 204 are members of some Church, of whom 50 have the ministry in view.

In 20 religious colleges two-thirds of the total number of students are members of churches. In the undenominational colleges there has been a growing respect for religion and morality. A total abstainer is not now sneered at as a crank. There has been a great growth of personal dignity and self-respect. Pranks are less common. The spirit of earnestness and manliness is stronger. There has been a growth in theistic thinking, even among the Spencerians, and the recent works of Mr. John Fiske and Mr. F. E. Abbott are cited as examples of this hopeful change. The earnestness of science seems to be taking on a religious tone, and religious thinking is becoming scientific. With this growing spirit of seriousness we may expect to see a growth of liberality toward the colleges on the part of the moneyed men. Men feel safe in spending their money on earnestness. Nothing else pays such handsome dividends. As a confirmation of this promising sign of the times it may not be out of place to introduce some testimony as to the facts. President Eliot of Harvard says in a report of Union Theological Seminary, "Drunkenness has decreased very decidedly. The sense of personal honor and self-respect has strengthened. Public sentiment among students has improved. On the other hand vices which are born of luxury and self-indulgence tend to increase. Part of the utility of athletic sports in colleges is that they combat this tendency to luxury." Dr. Barbour, College Pastor at Yale, says: "The behaviour of the Yale students of late years, in the judgment of their instructors, has been most exemplary. College athletics, encouraged as they are here on moral grounds, contribute to the lessening of lower enjoyments among our young men." Ex-President Hopkins, of Williams, says: "There was a time when we felt it necessary to exact a pledge from every student that he would not use intoxicating drinks on college grounds. At present no such pledge is required by college orders. There has been, too, a gradual change of sentiment in the community, and so among the young men, in regard to college tricks, and disturbances generally, and so an improvement." President

Bartlett, of Dartmouth, says: "There has been unquestionably at Dartmouth for several years a steady and marked improvement in college morals. The brutal element is almost extinct—hazing absolutely so. A false sense of honor is giving way to a true one. We are making earnest efforts to do away with the notion that students have a different standard of honor, morals and obligations from other men." We do not doubt that if a similar enquiry were set on foot in Canada the reports from our Canadian colleges would be as encouraging. If the young men of our colleges are stalwart, self-respecting, earnest men there is no fear of a decadence in national honor or power. Lord Bacon said, "The best materials for prophecy are the unforced opinions of young men." This is as true in morals as in politics.

DIFFERENT SENSES OF HEAT AND COLD.—In a late number of *Science* an account is given of a series of experiments by Mr. A. Herzen, lately published in the *Archiv für physiologie*, which go to show that the physiological sense of cold is different from that of heat. He awoke one night and found one of his arms outside of the bed-clothes and "asleep." When he touched it with the other hand he found the sensibility to warmth remained while that of touch was gone. He was further surprised to find that the cold substances produced no sensation. By compression of nerve-trunks and reproducing that state he discovered that the sensibilities to sensation left the arm in the following order: First, that of touch; very soon that of cold, the sense of warmth remaining much longer; and lastly, the sense of pain. The impressions of cold travel to the brain more quickly than those of warmth; the sense of cold and the sense of pain bear the same relation to each other. The senses of cold and touch on the one hand and of heat and pain on the other are so related it is impossible to unite them or reduce them to different modifications of touch and heat. It has been demonstrated that there are isolated irregularly distributed points upon the body set

apart, each for one sensibility either of warmth, cold or touch. Experiments upon cats and dogs led to the following results:—1. The so-called sense of heat and cold is in reality composed of two senses quite independent of each other. 2. Observations on healthy and diseased subjects show that the sensations of heat and cold are transmitted by different nerves, by different routes, and to different brain-centres. 3. The gyrus sigmoidens contain the centre of the touch and cold sensations. 4. These sense-perceptions are transmitted through the posterior columns of the spinal cord, while those of the senses of pain and warmth are conveyed through the gray substance.

THE HYDRIODIC ACID TESTS.—Some time ago there appeared in our pages a description of the uses and beauties of Dr. Haanel's discovery in blowpipe analysis, a discovery destined to work a revolution in that branch of science, simplifying and rendering more speedy and certain the recognition of more than half the common metals. This new method, in which characteristic coatings are formed on smooth plaster tablets by the action of hydriodic acid and other re-agents, has been everywhere received with great favor by those competent to judge of its value. The Royal Society at Ottawa grew enthusiastic over it, and went to an expense of several hundred dollars to have Dr. Haanel's paper suitably illustrated. The proceedings of the Royal Society, distributed to the chief learned societies and universities of the world, called attention to the subject by the handsome colored plates, and, as a result, letters of congratulation and requests for permission to use the method have reached Dr. Haanel from different parts of America, from England and Wales, and from Germany and Austria; and the discovery is also introduced into the celebrated Columbia School of Mines, and various mining schools and universities in Europe and Great Britain. It is with no small pride and satisfaction that we call attention to the widespread recognition and appreciation of the brilliant scientific work done by a member of our own university staff.

RATIO OF INCREASE OF HEIGHT TO INCREASE OF BULK IN THE CHILD.—Rev. Malling Hansen, Principal of the Danish Institution for the Deaf and Dumb, has recently, according to the *Lancet*, made some interesting observations on this question, in the case of one hundred and thirty children—seventy-two boys and fifty-eight girls. Weighed four times a day, in groups of twenty—in the morning, before dinner, after dinner, and at bed-time—for four years, this result was arrived at: that increase in weight and increase in height do not proceed uniformly throughout the year. The greatest increase in bulk extends from August until December; a period of equipoise from December until the middle of April; and the period of least increase extends to August. This, the period of minimum increase in bulk, is the period of maximum increase in height. In autumn the height is stationary, but the bulk increased. In spring and early summer the bulk remains about the same, but the height increases four times as fast as in September and October. Increase in height and increase in bulk are in inverse proportion. The same thing has been noticed in trees. *Science* quotes, in connection with these results, those of Dr. W. R. Miller, of the West Riding Convict Prison, obtained from four thousand prisoners during thirteen years, and differing somewhat from Mr. Hansen's. Dr. Miller found that in adults the maximum increase in weight occurs from April to August, and the minimum from September to March. The body becomes heavier in summer and lighter in winter. The reason is supposed to be the more active excretion of carbonic acid gas in the colder months.

PROGRESS IN PSYCHOLOGY.—A notable example of the remarkable development of separate branches of science is found in the case of psychology. As a science it is not over fifty years old, yet the field is already so broad that specialism is a necessity. In England, Germany, France, Italy, and the United States, there is increasing interest in the subject. M. Ribot, the celebrated author, holds that a psychologist is a naturalist, a

biologist. He is to work according to the scientific method, observing objective facts and verifying hypotheses. Ribot seems inclined to separate the science altogether from metaphysics and religion. It is perhaps well that it should be so until the field is more completely explored. Independence is the mother of new conceptions. Metaphysics, however, cannot afford to keep aloof from psychology. The study of the structure of the eye has explained many facts of mental impression through vision, and the study of psychological facts in conjunction with physiology and pathology must throw light on many indeterminate problems in metaphysics. Indisputably our mental activities are conditioned on nervous arrangements and possibilities. We are obtaining some results as to the rate sensation travels along the nerves and as to the time of the oscillation of the brain cells. This latter must determine the law of thought, just as the former determines the law of sensation. Experimentation in this field is extremely difficult. Nevertheless, we must expect that the next great advance in science will be in this field. The new methods of study taught by the evolutionary theory will be applied here, and the very blossoming of the physical sciences will be found in psychology. Much physiological work yet remains to be done before any great work can be accomplished. Investigators are rapidly supplying the demand created by this new science. Societies, also, for psychical research, in England, Germany, and the United States, have been at work, and though only a few of the results so far have been in the highest degree satisfactory, they will doubtless bring to light some occult powers of the nervous system and unnoticed mental processes. These reveal the trend of much of the keenest investigation of the future, the results of which must be of intense interest to all students of the mind, to all educationalists and philanthropists.

Professor Wundt has been carrying on experiments in his laboratory at Leipsic, and gives the results in a volume of essays. Some of these results are of great interest. If we are expected to press a key as soon as we see a flash of light, to our

consciousness the action is instantaneous. Generally from an eighth to a sixth of a second has elapsed. About one-half of the tenth is taken up in central brain processes, the remainder is taken up in conveying the impression to and from the brain. Now, if we wait till we distinguish the color of the light and then touch the key, we will be able to determine the difference between the time it takes to perceive the light and the time necessary to distinguish its color. This is called the "distinction time." The time required for hearing or seeing syllables, words, phrases, seeing colors, pictures, etc., can be measured, and the time varies as the complexity. It is found that it takes almost as long to perceive a single letter as it does to perceive a word of two syllables, which demonstrates that it is by the general form, and not by the individual letters, that we distinguish the word. Again, if the experimenter agrees with his assistant that if a red light be perceived the reaction shall take place with the left hand; and if a blue light, with the right. This gives them time to perceive a light which has already been measured, the time necessary to distinguish the blue and the red lights already obtained, and the time which it takes to make the choice of the hand to be used. This is called the "choice time." If the choice is one of two, the time is one-tenth of a second, and if one of ten, it is one half-second The psychic process next measured was that of *association*—the calling up of one idea by another. This is a higher and more complex mental operation, and consequently requires more time—from one-half to three-fourths of a second. It has been well remarked that this offers one of the most delicate texts of character. The time differs with different individuals, and with the same individual the time for different associations differs. The habitual thought of the individual is revealed in those associations which take least time.

The strangest result is that intense attention actually makes one hear or see a thing before any sound is made or the object is in sight. If a pendulum rings a bell at a certain point in its swing, and the time between the beginning of the swing and

the stroke has become fixed in the mind, the stroke of the bell begins to be anticipated, and is soon made to ring a fraction of a second before it really sounds. We hope in another issue to give some further results. These, however, will show how earnestly our mental processes are being studied from the side of physical science. All these researches have to do with the element of time; and as time is the unescapable element of consciousness, a union is possible between physiological psychology and metaphysics.

CREMATION.—The practice of cremation seems to be growing in favor. In Paris a crematorium, to cost $40,000, is to be erected. In Italy there are over 34 cremation societies, the society in Milan taking the lead. The greatest objection to the present method is the danger of polluting the water supply and spreading disease germs. The greatest objection to cremation is the facility it would give for the concealment of crime; but this is met by enacting that in suspected cases an autopsy shall precede incineration. In Massachusetts the practice is taking root. Cremation has been legalized by the Legislature. The trustees of the Mount Auburn Cemetery have been considering the advisability of establishing a crematorium; but as the acts of incorporation provide for interment only, they will prepare depositories for the ashes of the cremated. The "ashes of our fathers" will be as sacred to us when preserved in a columbarium as when laid in the cold ground. As powerful as ever over the heart will be their memories when they "rule our spirit from *their urns.*"

MR. C. C. JAMES, B.A., who, since its inception, has been Editor of KOSMOS, was, at the beginning of this year, appointed to the chair of chemistry in the Agricultural College, Guelph, which chair was vacated by the death of the late Dr. Hare. Those who know Mr. James's abilities are not surprised at this appointment; and while we congratulate him on his promotion, we likewise congratulate the Agricultural College on obtaining one so efficient to fill a chair so important. This adds another

name to the already somewhat lengthy list of professors which Victoria University has given to the colleges of America. Though Mr. James is no longer upon our editorial staff, we shall, from time to time, be favored with articles from his graceful pen.

PHYSICAL EXERCISE.

THE term *physical exercise* has been employed in a limited sense to denote the modern system of *bodily exercise*. In another sense the term includes those manly and healthful exercises which have been encouraged by all high-minded nations as calculated to improve the physical strength and to keep alive the martial spirit of the people. In the general acceptance of the term, however, it denotes every exercise which tends to develop and invigorate the bodily powers. This will include athletic sports, sleep, diet and recreation of all kinds.

While endeavoring to treat of the subject in its most general acceptation, and apply it especially to students, I have been under obligations to Dr. Oswald for many of the thoughts herein contained.

Physical strength was indeed the god of antiquity, and we therefore find the elements of physical culture in most nations from earliest times. In the infancy of society, when the individual was valued according to his personal strength, it was quite natural that the utmost care should be bestowed on those arts which most surely lead to distinction. All education then consisted chiefly in the practice of such exercises as were estimated to be best for the development of muscular strength, and to make life as long as possible. These exercises were at a very remote period systematized and reduced to a science by the Greeks, and gymnasiums were built for the purpose of giving everyone a thorough physical training. It is well known that the Greeks provided for their children the most complete physical training the world has ever known. Women as well as men took pains and pride in the development of perfect

bodies, and their success affords us models of human beauty and strength. Among the Romans the duties of camp life, and the games on the Campus Martius served to take the place of the gymnastic exercises required by the Greeks. We notice the Romans named their army from exercise—*exercitus*. In the Middle Ages, instead of the gymnastic exercises of the Greeks, we have chivalry, with jousts, feats of horsemanship, the arts of fencing, and such like exercises. Still later we notice the advance of civilization, which modified the system of warfare by the invention of gunpowder, and thus decreasing the value of individual life, closed the career of the champions and votaries of physical strength, and we see physical culture (gymnastic exercise) in the course of time almost completely neglected.

Of late years public attention has been drawn to the increasing deterioration in the physique of the population of England, and several proposals have been advanced to check an evil which can no longer be concealed. Those who suffer most are the children of the poorer classes in large cities, who dwell cooped up in narrow, ill-lighted and worse ventilated courts, from which they are often dragged to undergo a certain amount of mental training, in many cases, perhaps, too severe to be sustained by their debilitated and enfeebled bodies. Thus whilst so much is being done for the mental culture of the rising generation, their physical culture is left very much to inclination or chance.

"Physical vigor," one says, "is the basis of all moral and bodily welfare and a chief condition of permanent health." Without the stimulus of physical exercise the complex organism of the human body is liable to disorders. Physical exercise, by increasing the action of the circulatory system, promotes the elimination of effete matter and quickens all the vital processes. The full development and the continued vigorous condition of the circulatory system are of great importance to health. If we desire to possess maximum vigor we must have large lung capacity, and, most of all, a stout heart and elastic arteries. Does physical exercise procure for us these requisites? We

claim it does by two great means, viz.: First, it accelerates the destruction of degenerating substance in the involuntary muscles of the heart and arterial walls, which is requisite to the substitution of newer and more useful substance in them. Second, by the increased blood-tension more nourishment will be carried to the heart and arterial walls. The increased blood-tension gained in exercise may be productive of many other valuable results. For instance, the blood is drained from the overcharged brain, thereby requiring an increased production, by diverting its course into previous only half-dilated channels, whose sluggish currents now become swift streams of lively blood. Again, in consequence of this increased blood-tension both the secretions and excretions are accelerated, thereby developing the capacity of the glandular organs, and also directly aiding the body both in the riddance of waste material and in the production of the necessary fluids. This increased blood-tension is also a special advantage in aiding digestion.

Very few persons will take objection to the proposition that students should exercise their bodies, but it is difficult to prescribe the particular amount and kind of exercise needed; yet all agree that to be essential to health it should be so regulated as to be recreative but not so excessive as to be exhausting. There are numbers of intelligent men who even assent to these generalities, but never waken to the real truth of them till a violated law of nature inflicts its penalty in their own ill health.

Let us start out with two principles, viz.: *First.* That young men who study need physical exercise. *Second.* That exercise, to be beneficial, should be regular and systematic. We will take up the first principle and consider what physical exercise does and how really important it is. We admit the truth of the old and wise saying regarding a "sane mind in a sound body," but we are too apt to look upon the sound body as a mere accident of inheritance or environment. Few but physicians read this as indicating a connection between body and mind by means of which make, or help to make, a good healthy

brain by making a good sound body. In the fact that the brain always seems to direct the body, we are apt to forget that the body carries the brain and feeds it with its own life. If the body, therefore, has good blood the brain will have good blood also. If the body does not furnish good material, the brain will do, according to its capacity, poor work or no work at all. We do not wish to deny that many men of weak bodies have done good brain work, but we do say that many such men have been hindered from doing better work by this same physical weakness. Moreover, no one can say that the work done would not have been greater and better if the men doing it had only had better bodies. Most men recognize the connection and sympathy between mind and body, after the body has attained maturity, but during the time of growth this interdependence is usually disregarded.

Dr. Clark, in a work entitled "Building of the Brain," divides brain-work into two classes; viz., one which we may call (and quite properly, too) *Body Brain-work*, and the other, *Mind Brain-work*. Body brain-work is essential to the healthy existence of the brain and really comes first in the order of brain growth. No one can take one hand and develop it without developing other parts of the body. In the same way "the child, too young to know anything except its bodily wants, and then conscious of them only when the denial of them causes pain, develops brain every time it makes an effort to grasp the thing it wants." The movement of its hand is as necessary to the development of its brain as the guidance and government of the brain are to the growth of its hand. What is true of the hand is true of the other bodily organs whose motion is under the control of the will. They and the brain are developed by reciprocal action. Interfere with this body brain-work in childhood, or at any period of growth, either by repressing it or by diverting from it too much vital energy to *mind brain-work*, such as is involved in the acquisition of knowledge, and you not only stunt the body, but also enfeeble the brain, by depriving both of their proper growth. The worst feature of

such interference, at such a time, is that the evil then done can not be wholly remedied, and the power lost to body and brain can never be entirely regained.

Now, at the time of life when young men come to our colleges, when, in many cases, all their bodily organs are approaching maturity, ought this body brain-work to cease or can it without danger be neglected? Is it not most essential that at this very period the reciprocal action between body and brain should be steadily maintained in order that each should be able to endure the new strains put upon them. Acquisitions of knowledge, scholarships and ambitious desires for prizes and medals, all incite them to neglect physical exercise (body brain-work) under the mistaken impression that time given to that is time lost completely. Many a *fine scholar* has left college with great honors to experience in his subsequent career the serious results of the mistake made at college, and has discovered, often too late, that a vigorous body to carry his brain is more essential to success in life than a well-trained brain full of knowledge, but lacking a strong body from which to draw its nourishment and strength.

We have said "exercise, to be beneficial, should be regular and systematic." We now say to be *more* beneficial it should be in the open air, and to be still more beneficial the mind should be interested in the exercise while the body is engaged. Then the great question is, "How shall all these requisites of the best kind of exercise be secured?" We reply, in brief:—

(1) A regular set *time* for exercise;

(2) A fixed *amount* of time devoted to it;

(3) A *place* where the lungs should breathe fresh air;

(4) A kind of exercise which should engage the mind as well as the body.

One has said "Every disease is a protest of Nature against an active or passive violation of her laws. But that protest follows rarely upon a first transgression, never upon trifles; and life-long suffering—the effects of an incurable disease excepted —generally imply that the sufferer's mode of life is habitually unnatural in more than one respect."

Active exercise in the open air is a medicine, not patented, which far surpasses most medicines compounded by our most skilful physicians. Air is a part of our daily food, and by far the most important. Every breath we draw is a draught of fresh oxygen, every emission of breath is an evacuation of gaseous recrements. The purity of our blood depends largely on the purity of air we breathe, and perfect health depends upon a daily supply of fresh air. The desire for physical exercise is natural. The prejudice against all natural propensities is strikingly refuted by a young child's love for outdoor exercise. A healthy boy prefers even the hardships of our northern winter sports to the atmosphere of a room comfortably heated, and in the summer-time the paradise of childhood is a shady bower in the open air, or perhaps the scorching sun is preferable to the shade.

Sleep. Let us consider in brief the part sleep plays in physical exercise. We will ask ourselves the question, "What is the necessity of sleep; in what way does *it* develop and invigorate the bodily powers?" We answer as follows: Sleep promotes digestion, repairs the waste of the muscular tissue, favors the process of cutaneous excretions, and renews the vigor of the mental faculties. During sleep the organ of consciousness, though never fully at rest, is comparatively so, and the energies of the system seem to be concentrated on the function of nutrition and the renewal of the vital energy in general. Or, to use the figurative sentiment of Dr. Oswald, during sleep "the cerebral workshop is closed for repairs, and the abused and exhausted body commits its organism into the healing hands of Nature."

To us it seems that the amount of sleep required by man is generally proportionate to the waste of vital energy, whether by muscular exertion or mental activity; but, under favorable conditions, eight hours of undisturbed sleep would almost suffice to counteract the wear and tear of the sixteen hours that one is awake. In order not to appear to be laying down a fixed law for length of time for sleep, we might just here

note that the requisite amount of sleep depends on temperature, occupation, and age, but in most persons seven hours should be the minimum.

Nothing can be more injudicious than to rob ourselves of sleep in order to gain a few hours more for study. The plan defeats its own purpose, for such persons are never wide-awake; and though they may prevent themselves from actually sleeping, they can not prevent themselves from dozing with their eyes open. It has been said, and with much truth, taking all things into consideration, that "a wide-awake student will learn more in one hour than a day-dreamer in ten."

Habitual deficiency in sleep will undermine even the strongest constitution. It is a curious fact, that compulsory wakefulness combined with mental activity often induces a state of morbid *insomnia*, an absolute inability to obtain the sleep which it was at first so difficult to resist. We might just here note, that in such cases the only remedy is fresh air and a complete change of occupation. Sleeplessness may lead to chronic hypochondria and even to idiocy.

In closing, we wish to say that whatever is done in our day to make the men and women more athletic, should have the support of every good citizen as well as of every Christian. There is no reason why physical exercise should not be positively religious. We are sometimes too apt to ascribe to a wicked heart what ought to be ascribed to some physical weakness. The body and the soul are such near neighbors that one often, as it were, catches the disease of the other. Those who do not know what it is to be sick have more for which they must answer than those who are subjects of life-time infirmities. He who can lift twice as much as another, and walk twice as far, and work twice as long, will have a double account to give in the judgment, for it is our belief that we must be brought into judgment for the use we have made of our physical organism; that we must answer for the use of every talent, whether it be of physical energy, or mental acumen, or spiritual power. How often one finds

physical energy not indicative of spiritual power! There are many who realize they ought to use their money and intelligence aright; but how few there are who are aware of the fact that they should use their physical organism aright! If a clear head is of more value than one dizzy with perpetual vertigo; if muscles flourishing with health are of more value than those shrunken by chronic rheumatism; if an eye quick to catch passing objects is better than one with vision dim and uncertain, then God will require of us efficiency in proportion to what He has given us. F. L. SWITZER.

FLASHES FROM THE DISCUSSION.

THE essayist was criticized for placing sleep under the head of physical exercise.

The foundation of national greatness is to be found in the soundness of the constitutions of the people.

The best gymnasium in the world is the harvest field.

"A man cannot be a good liver unless he has a good liver."

The criminality of slow suicide by overwork and underwork was strongly emphasized.

Health is what the student needs, not great strength; harmonious development, not immense muscular development; agility, not superabundant power. The heavy lifters of a circus are never so healthy as the trapeze actors. To supply a great mass of muscles with nourishment leaves the brain unnourished.

We have just so much energy to be spent in work. Too much used up in physical exercise leaves the brain weak.

The figures of Dr. McCosh on the college standing of athletes were quoted. Students at Princeton are graded in six groups. All the athletes stand well down. Out of a total of twenty-seven athletes, fifteen are in the two lowest grades. All but seven are below the middle; only two stand in the second grade. "Bodily exercise profiteth little" when excessive.

Exercise must be accompanied by careless, cheerful thoughts. Walk with cheerful companions, with Nature, with God. Rule—breeziness and briskness. There can be no abitrary rule

laid down as to amount of sleep necessary. The personal equation must decide. There should be regularity, but this must not be allowed to become a tyrant. How should we deal with the first strong impulse to sleep? Is it a dictum of nature? Should we obey or conquer?

SELECTIONS.

MARK TWAIN ON SCIENCE.—In the space of 176 years the lower Mississippi has shortened itself 242 miles. This is an average of a trifle over 11.3 miles per year. Therefore any calm person who is not blind or idiotic can see that in the oolitic Silurian period, just 1,000,000 years ago next November, the lower Mississippi river was upward of 1,300,000 miles long, and stuck out over the Gulf of Mexico like a fishing-rod. And by the same token any person can see that 742 years from now the lower Mississippi will be only a mile and three-quarters long, and Cairo and New Orleans will have joined streets together and be plodding comfortably under a single mayor and board of aldermen. There is something fascinating about science. One gets such wholesome returns of conjecture out of such a trifling investment of fact.

A WONDERFUL SIGHT.—On the northern side of Mousseau's Lake, in the county of Ottawa, a short distance from the shore, may be seen an immense rock about two hundred feet long and sixty feet high, which, by some convulsion of nature, has been split asunder in the centre and shoved sixty or seventy yards apart, leaving that width of space between the two halves. On one side can be seen great hollows, and on the other projections corresponding with them, thus plainly showing that the two great masses of rock at some time were one immense boulder, or, rather, mountain of granite. This great natural curiosity is well worth a journey of many miles to see. The Gatineau country is rich in strange and magnificent scenery, amongst which this grand gateway of granite is not the least wonderful and interesting.—*Bryson Equity.*

THE *Challenger*, on its voyage, studied the sea bottom. It appears that on the surface, and at every successive depth below, there is life; as the creatures die, their remains fall to the bottom, where they are the appointed food of other creatures. At a depth of several miles, the *Challenger* found and brought up a creature seven feet high. Many of the creatures at these depths are more or less phosphorescent. Water is the chief ingredient of life. It is the food, the blood, and the strength of these poor creatures—far more than the constituents of our own physical frames. It is water alone, inside, that can withstand the pressure of two and a-half tons to the square inch, a pressure that will crush beams of pine wood as if they were passed through rollers; but that has no effect on sponges, mollusks, and even lighter creatures, that almost disappear in the air and sunshine.

ALCOHOL.—Enough, and more than enough, perhaps, has been uttered concerning the prejudicial effects on the body of habitually using alcoholic beverages. It is rare now to find any one, well acquainted with human physiology, and capable of observing and appreciating the ordinary wants and usages of life around him, who does not believe that, with few exceptions, men and women are healthier and stronger, physically, intellectually, and morally, without such drinks than with them. And confessedly there is little or nothing new to be said respecting a conclusion which has been so thoroughly investigated, discussed, and tested by experience, as this. It is useless, and indeed impolitic, in the well-intentioned effort to arouse public attention to the subject, to make exaggerated statements in relation thereto. But the important truth has still to be preached, repeated, and freshly illustrated, when possible, in every quarter of society, because a very natural bias to self-indulgence is always present to obscure men's views of those things which gratify it.—*Sir Henry Thompson, in Popular Science Monthly.*

BOOKS IN THE BRITISH MUSEUM:—How the books accumulate here! The museum is one of the five libraries in the

kingdom to each of which is secured by law a copy of every publication the copyright of which is registered at Stationer's Hall, the other libraries being the Bodleian at Oxford, the public library at Cambridge, the Faculty of Advocates at Edinburgh, and Trinity College, Dublin. Authors and publishers often feel it a hardship to be compelled to present copies of their books to some or all of the other libraries, but rarely do they grudge the copy which goes to the great national library. For the year 1883 the number of accessions to the library obtained in this way was 10,612 volumes, besides many parts of volumes, pamphlets, music, maps, etc. But this represents but a small portion of the yearly additions to the library. For the same year there were presented 2,692 volumes and purchased 2,350 volumes, these latter being principally publications in foreign countries. The gross total of additions of all sorts for the year was 94,306. Some idea of the extent of the library may be gained from the size of the general catalogue, consisting of over 2,000 volumes, most of which is still in manuscript, although a beginning was made in 1881 with the labor of printing it. The amalgamation of the several catalogues from which it is compiled has taken years to complete. About a fifth of the task was finished when the present reading-room was built, and now, nearly thirty years after, the work is on the eve of being completed.—*Chambers' Journal*

THE EXPLORATION OF HUDSON BAY.—In the month of February last a report was laid before the Parliament of Canada, detailing the results of an expedition despatched by the Government of that country, particularly for the purpose of inquiring into the navigability of Hudson Strait and Bay, and, at the same time, of gathering information concerning the resources of that region, and its availability as a field for settled habitation. This report represents the first properly organized attempt that has ever been made to pierce the secrets of Hudson Bay for the public benefit. It is at first blush not easy to understand why this mighty expanse of water, occupying the peculiarly important position that it does, should remain for so many generations

comparatively unexplored and wholly unutilized, except as a hunting-ground for a few New Bedford whalers, or a medium of easy communication between some half-dozen scattered factories of the Hudson Bay Company. Although called a bay, it is really an inland sea 1,000 miles in length by 600 in width, having thus an area of about 500,000 square miles, or quite half that of the Mediterranean. It drains an expanse of country spreading out more than 2,000 miles from east to west, and 1,500 from north to south, or an area of 3,000,000 square miles. Into its majestic waters pour feeders which take their rise in the Rocky Mountains on the west, and in Labrador on the east, while southward it stretches out its river-roots away below the 49th parallel until they tap the same lake-source which sends a stre[illegible]n into the Gulf of Mexico. Despite its distance northward, its [illegible]ue waves are never bound by icy fetters, and its broad gateway to the Atlantic is certainly navigable four months of the year, and possibly all the year round to properly equipped steamships. Its depths abound in finny wealth, from the mammoth whale to the tiny caplin. Its shores are serrated by numerous streams, some navigable for long distances inland, and all stocked with the finest of fresh-water fish, and clothed as to their banks with valuable timber ready for the lumberman's axe. Its islands are rich in mineral ore of many kinds. The country whose margin its tides lave is well adapted for tillage and pasturage, while all around the region swarms with animals and birds whose flesh or fur render their chase a highly lucrative employment.—*Popular Science Monthly.*

"THE DESCENT OF MAN. By Charles Darwin. Complete in four parts of the Humboldt Library of Science. [illegible] Fitzgerald, Publisher, 393 Pearl St., New York." No. 77 of the Humboldt Library (a double number, price 30 cents) completes this great work. The price of the "Descent of Man" in this excellent edition is only 75 cents, and thus this most celebrated of Darwin's writings is brought, unabridged, within the reach of all classes of readers.