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DECEMBER, 1886. VOL. IV., No. 4.

Kosmos.

SCIENCE ASSOCIATION:
VICTORIA UNIVERSITY, - - COBOURG, ONT.

CONTENTS

Kosmos (formerly *V. P. Journal*) is a quarterly, established and controlled by the Science Association of Victoria University, but is not devoted to local or denominational interests. Its object is to promote, by original and carefully selected articles, the earnest discussion of important questions in Science, Literature, Education, and Social Reform. It is published in March, June, September, and December of each year.

All business communications should be addressed to

A. E. LANG, Business Manager,

COBOURG, Ont.

All articles, correspondence, etc., intended for publication in the journal, should be sent in at least three weeks before the beginning of the month of issue, addressed to

W. W. ANDREWS, Editor, Kosmos,

Drawer 16, COBOURG, Ont.

$1.00 PER YEAR — 30c. PER COPY.

Extras to subscribers, 25 cents. Subscriptions may commence with any number.

KOSMOS.

VOL. IV.] DECEMBER, 1886. [NO. 4.

WORLD'S CONVENTION TO DEFINE AND PROMULGATE A PERFECT AND UNIVERSAL RELIGION.

A LECTURE BY PRESIDENT W. F. WARREN, D.D., LL.D., OF BOSTON UNIVERSITY.

A FEW evenings since, as I was walking up one of the main streets of Tokio, I encountered an experience not soon to be forgotten. My companion, who was the American Minister to the Mikado's court, was pointing out to me at a considerable distance a large hall, called the Meiji Kuaido, and explaining that though now belonging to the Government, it was originally built in a spirit of opposition to Christian missions, and was designed to be a kind of headquarters for all who wished to rehabilitate the old religions, or in any way oppose the spread of the Christian faith. While he was narrating some incidents connected with it we came nearer and nearer, but soon found our further progress blocked by an altogether unprecedented crowd of people, evidently made up of the most diverse nationalities. It filled not only the approaches to the building, but also the whole street for some distance in front and on either side. Upon inquiry we learned that a convention of quite unusual interest was in progress, and that all these people whom the building could not contain were waiting to learn what they could of the progress of the deliberations within. One man kindly showed us a copy of the call under which the convention had been brought together. At its top I read these words: "World's Convention for the Definition and Promulgation of a Perfect and Universal Religion."

The provisions under which the delegates were to be appointed and the Convention organized were carefully drawn and admirably adapted to secure a most weighty and representative body. Nearly every religion and sect I had ever heard of—except the Christian—was named and provided for.

Of course I was at once intensely interested to see so rare a body—the first of its kind in the history of the world. But the crowd was so dense I was almost in despair. Fortunately, in our extremity two stout policemen recognized my companion; and, knowing his ambassadorial character, undertook to make a way for us and to bring us into the hall. The struggle was long and severe, but at last our faithful guides succeeded in edging us into an overcrowded balcony to a standing place, from which nearly the whole body of the delegates could be seen. Never can I forget that many-hued and strangely clad assembly. Nearly every delegation had some sacred banner or other symbol by which it might be distinguished.

In the centre of the hall was the yellow silken banner of the Chinese dragon. On the left I saw the crescent of Islam; on the right the streamers of the Grand Llama of Thibet. Not far away was the seven-storied sacred umbrella of Burmah, and beyond it the gaudy feather-work of a dusky delegation from Ashantee. In one corner I even thought I recognized the totem of one of our Indian tribes of Alaska. On the programme there were five questions, each evidently framed with a view to make its discussion and answer contribute towards the common end—the definition of a perfect and universal religion. The first read as follows: "Can there be more than one perfect religion?" The opening of the discussion of this had been assigned to a great Buddhist teacher from Ceylon. The second question, to be opened by a Mohammedan, was: "What kind of an object of worship must a perfect religion present?" The third was assigned to a Taoist, and was thus formulated: "What must a perfect religion demand of and promise to the sincere worshipper?" The fourth, assigned to a Hindu pundit, was the following: "In what relation must the divine object and

the human subject stand to each other in a perfect religion?" The fifth and last question read: "By what credentials shall a perfect religion, if ever found, be known?" The honor and responsibility of opening this last and highest of the proposed discussions was reserved to the official head of the Shinto priesthood of Japan, the highest representative of the ancestral faith of the Empire.

As soon as my friend and I could get our bearings, we were pleased to find that only one of the questions had been discussed and acted upon by the Convention before our arrival. We were told that the assembly had been opened by the President designated in the call, and that nothing on earth was ever more impressive than the three minutes of silent prayer which followed the uplifting of the chairman's hand and eye. After this there had been a brief address of welcome from the committee of arrangements, a few words of thanks from the President in response; then a short opening address by the President, and the introduction of the distinguished Buddhist representative from Ceylon, who was to discuss the question: "Can there be more than one perfect religion?" To a Buddhist, there could be, of course, but one answer to this question, and that a negative. But he argued it—as our informants told us—with wonderful tact as well as power. He kept the qualification "perfect" so prominently before his hearers' minds that, however accustomed any of them might be to think and say that there may be and are many good religions, none could fail to see that of perfect religions there could be but one. He also carefully abstained from identifying his own system with perfect religion, and thus avoided the mistake of exciting the jealousy of rival religionists. So complete had been his success that, after a short discussion, in which several very diverse speakers participated, a venerable Parsee had moved, and just before our arrival the Convention had unanimously adopted, the following resolution: "Resolved, that in the opinion of this World's Convention there can be but one perfect religion."

While we were getting hold of these facts we lost the Presi-

dent's introduction of the second preappointed speaker. We soon learned, however, that he was the senior moulvie of the great Mohammedan University at Cairo, a school of Islam in which there are all the time about ten thousand students in preparation for the duties of public religious teachers and chanters of prayers. His piercing eye and snow-white beard and vigorous frame would have made him anywhere a man of mark. Seated, after his manner of teaching in the mosque, upon a low bamboo frame, clad in his official robe, he looked like a resurrected Old Testament prophet—an Isaiah in living form before us. At first I wondered if he would be able to speak on so modern a question as the one assigned him: "What kind of an object of worship must a perfect religion present?" Time would fail me were I to attempt to report with any fulness his rhythmic speech. It was Oriental through and through—quaint, poetic, full of apothegms, proverbs, parables—but it conclusively answered the question. He made even the feather-decked greegree worshippers of Western Africa see that a God who knows much about his worshipper, and can do great things for him, is more perfect than a God who knows little and can do but little. Then, arguing up and up, he made it plain to every intelligence that a perfect religion necessarily demands a God possessing all knowledge and all power. It becomes a perfect religion only by presenting to the worshipper as the supreme object of obedience, love, and service a perfect being. He showed also that perfection in an object of worship required that it be a living object, that it have intelligence, rational feelings and purposes—in a word, that it possess real and complete personality. It must be possible to address him as a personality. He needs to be in every place, to be before all things, in all things, above all things. Limit him in any respect, and the religion you present becomes less than perfect.

This was the thought stripped of all its weird and ornamental adornments. But as he expanded and enforced it his eye kindled and his chant-like speech rose and fell, and rose and fell until we hardly knew whether we were in the body or out

of the body, so wondrous was the spell wherewith he had bound us. He was followed by an eloquent representative of the Brahmo Somaj, and he in turn by a Persian Babist, both of whom argued in the same line with such effect that when a picturesquely turbaned representative of the religion of the Sikhs gained the floor and moved that it be the sense of the Convention that a perfect religion must present a perfect God, the whole vast assembly was found to be a unit in affirming this grand declaration.

Next, of course, came the third question: "What must a perfect religion demand of the sincere worshipper, and what must it promise to him?" To open its discussion the appointed Taoist teacher was politely introduced. As his noble form advanced quietly to the front of the platform, in the costume of a Chinese mandarin of the highest rank, it was at once evident that the better side of Taoism was to be represented—the ideas of Tao-teh-king, and not the superstition and jugglery of modern popular Taoism.

He began by saying that it seemed proper for him to start out from the point where the preceding discussion had stopped, the Convention having already voted that there could be but one perfect religion, and that this religion, in order to be perfect, must present a perfect object of worship. With both of these propositions he said he was in full accord, provided only that it be constantly borne in mind that the whole discussion related to a purely abstract or hypothetical question. "Now," said he, "if a man really had a perfect object of worship, it is plain that his duty toward it would be very different from that he owes to any of those finite and limited and imperfect divinities which we and our fathers have been accustomed to worship. Our duties to these, and their duties to us, are more analogous to our duty to observe courtesy toward our fellow-men and kindness toward those below us. The moment we picture to ourselves a perfect God, the maker, upholder and governor of all beings, lord even of the celestial and terrestrial spirits whom we are in the habit of worshipping, that moment we see that the

worship of such a being would of necessity be something very different. As giver of all our powers and possibilities, he could justly demand that we employ them all for the accomplishment of the purpose for which he gave them. Indeed, were he a perfectly rational being it would seem impossible that he should require less.

"On the other hand, such a being would of necessity possess both the power and inclination to give to his sincere worshipper the perfect fruit of genuine piety. This can be nothing less than perfect virtue, and even exquisite delight in virtue. In a perfect piety all self-conflict, all internal resistance to good, all self-will must be absolutely and totally eliminated. All fear—even of that perfect being—would have to be absent; nay, it would have to be transmuted into eager, unintermittent love. On the other hand, how unutterably would a perfect object of worship love and bless a perfectly sincere worshipper."

After many other touching words, particularly upon the woeful contrast between the ideal and the actual in life, and upon the arduousness of the struggle for virtue under religion, he closed by submitting the following proposition for the further consideration of the Convention: "Resolved, that a perfect religion will have to demand of man a perfect surrender of will and life to a perfect object of worship, and will have to promise him a perfect freedom and satisfaction in the life of goodness."

A Sufi from Ispahan, a Theosophist from Bombay, and various other speakers followed, all very nearly agreeing with the first, but some of them preferring a different wording of the resolution. Various amendments were proposed and discussed until at length the following substitute was offered: "Resolved, that if a perfect religion were possible to imperfect man, it would require of the worshipper a perfect devotion to a perfect God, and would demand of the perfect God a perfect ultimate beatification of the worshipper." This was unanimously and even enthusiastically adopted.

Question four was now in order.

The President arose and said: "The fourth question reads as

follows: 'In what relation must the divine object and the human subject stand to each other in a perfect religion?' The discussion of this question is to be opened by one who has himself ofttimes been the recipient of divine worship, and who represents an ancient and powerful priesthood believed by millions to be a real embodiment of the one Divine and Eternal Spirit. I have the honor to present to the Convention the venerated head of all the sacred houses of the Brahmins in the holy city of Benares." Calm as his own imposing religion, yet keener than any one who had preceded him, the Hindu addressed himself to his allotted task. For twenty minutes he held every eye and commanded every mind. How shall I give you any conception of that captivating discourse? The following is but the barest thread to intimate the great truths touched upon by his master hand.

He began by saying that some personal relationship between the worshipper and the worshipped was necessarily involved in the very idea of worship. In this act the worshipper is thinking of the object of his worship, otherwise he is not worshipping. So the being worshipped is thinking of his worshipper, otherwise he is not receiving the worship. Here then is mutual, simultaneous thought. Each has a place in the consciousness of the other. To this extent they possess a common consciousness. In this fellowship of mutual thought they are mutually related: by it they are vitally and personally connected. This connection may, of course, be of two kinds. If the God is angry with His worshipper, or the worshipper with his God, the relationship is one of hatred and antagonism. If, on the other hand, it is a relation of mutual inclination, the man sincerely seeking to please his God, and the God sincerely seeking to bless his worshipper, it is, of course, a relationship of amity, of good fellowship, of mutual love. But all religions agree that the first of these relationships, that of enmity and estrangement, is abnormal—one which ought not to be. All religions aim to remove and to transform such a relationship wherever it exists. It is, therefore, plain that the perfect religion, if there

be one, must require and make the personal relationship between the worshipper and worshipped a relation of mutual benevolence—a relation of mutual love. Nowhere can there be a perfect religion if the man do not sincerely love his God, and if the God do not sincerely love his worshipper.

Here the speaker raised a most interesting question as to degree. To what extent ought this love to go? There could be but one answer. In a perfect religion the love of the worshipper for the worshipped must, of course, be the strongest possible, particularly as the worshipped is himself all-perfect, and hence all-worthy of this love. So, on the other hand, the love of the worshipped toward the worshipper ought to be the very strongest possible. What, then, is the strongest possible love which the divine can bear to the human, and the human to the divine?

I cannot enough regret that my limits compel me to suppress his discussion of this pregnant question. I can only say that from point to point he carried the convictions of his vast audience until he had triumphantly demonstrated three far-reaching propositions:

1. That the ever higher and more perfect devotion of a worshipper can never reach its supreme intensity until he is ready and even desirous to merge his very will and life and being in the will and life and being of the all-perfect object of his worship.

2. That the gracious disposition of the object worshipped toward the worshipper can never reach its supreme intensity until the worshipped being is ready and desirous to descend from the divine form and mode of being, and in an avatar of compassionate love take on the form and limitations of his human worshipper.

3. That in a perfect religion the human subject and the divine object must be set in such relations that it shall be possible for God to become a partaker of human nature, and for man in some sense to become a partaker of the divine nature.

Profound was the silence which followed this wonderful dis-

course. The first to break it was a professor in the Imperial University of Tokio, a man who, though of European birth, was in complete sympathy with the purposes of the Convention. After highly complimenting the Brahmin speaker, he said that he himself had long been an admiring student of India's sacred books. With the permission of the Convention he would like to recite a few lines from one of them, the "Isa Upanishad," which seemed to him admirably to express the true relation subsisting between the worshipping soul and the Infinite. He then gave the following:—

> "Whate'er exists within this universe
> Is all to be regarded as enveloped
> By the great Lord, as if wrapped in a vesture.
> There is one only being who exists
> Unmoved, yet moving swifter than the mind;
> Who far outstrips the senses, tho' as gods
> They strive to reach him; who, himself at rest,
> Transcends the fleetest flight of other beings;
> Who, like the air, supports all vital action.
> He moves, yet moves not; he is far, yet near;
> He is within this universe. Whoe'er beholds
> All living creatures as in him, and him—
> The universal spirit—as in all,
> Henceforth regards no creature with contempt."

"Now, here," continued the professor, "here we have the true conception admirably expressed. Because the universal spirit is in all things, even in the worshipper, and, on the other hand, all things, even the worshipper, are in this universal spirit, it is more than possible—it is inevitable—that the divine should have participancy in the human, and the human in the divine. Few of the great religions of the world have failed to recognize in some way this basal truth. Even the Shamans of the barbarous tribes claim to exercise divine powers only when personally possessed of divine spirits. In Thibet, the faithful see in the distinguished head of their hierarchy, the Dalai Llama—with whose presence we to-day are honored—a true divine incarnation. For ages here in Japan the sacred person of the Mikado

has been recognized as a god in human form. The founders of nearly all great religions and states have been held to be descendants, or impersonations, of the gods. In like manner, the apotheosis of dying emperors, Roman and other, show how natural is the faith that good and great men can take on the nature and life divine. Ask India's hundreds of millions: they all affirm that every human being may aspire to ultimate and absolute identification with God. The even more numerous followers of the Buddha hold that, in his enlightenment, Sakya Muni was far superior to any god.

"Now, if such are the conceptions of the actual religions, how certain is it that the ideal, the perfect religion, must provide a recognition of them. I move you, Mr. President, that the propositions of our Brahmin orator from Benares be adopted as the voice of this Convention." No speaker appearing in the negative, the motion was put and carried without dissent.

Thus, with astonishing unanimity, the assembly had reached the final question upon the programme: "By what credentials shall a perfect religion be known?"

Intenser than ever grew the interest of the delegates. On the answer to this question hung all their hopes as to any practically useful outcome from the holding of the Œcumenical Convention.

Doubly intense was the interest of the onlooking Japanese; for here, in the presence of the world's religions, the highest and most authoritative religious voice of their Empire was now to be heard. Breathless was the entire throng as the speaker began:—

"Hail to the Supreme Spirit of Truth! Praise to the Kami of Kamis—the living essence of the everlasting, everliving Light.

"Why are we here, brothers from all climes, why are we here in serious search for the one true and perfect way? It is because he, in whom are all things, and who is in all things—as sang that Hindu poet—is yearning with ineffable affection to be known of us, his earthly offspring, and to

know us as his own. Only lately have I learned this secret. Only since my invitation to address this World's Convention have my eyes been opened to the blessed truth. Never before had I been led to meditate upon the necessary implications of a religion absolutely perfect. In preparation for my question I was compelled thus to meditate. Scarce had I addressed myself to my task before I began to see what you have seen, and to lay down the propositions which you to-day in due succession have been laying down. I could not help discerning that there can be but one religion truly perfect; that a religion can never be perfect unless it present a perfect God; that no religion can be perfect which does not deliver man from sin and death, and dower him with pure and everlasting blessedness. I could not help perceiving that no religion could ever claim perfection in which any gulf is left unfilled between the worshipper and the object of his worship. Oppressed and almost overwhelmed by these great thoughts, convinced that there was no such perfect religion in existence, nor any credential by which it could be known, I was yesterday morning alone in a favorite hermitage by the sounding sea near Yokohama. The whole night I had passed in sleeplessness and fasting. No light had dawned upon my mind. To cool my fevered brain I strolled upon the sea-shore, up and down, and listened to the solemn beating of the billows on the sand. Here, in one of my turns, I fell in with a stranger—a sailor fresh from his ship. In conversation I quickly learned that he had followed the sea from early life, that he had been quite round the world, and had seen more wonders than any man it had ever been my fortune to meet. Long time we talked together of lands and peoples underneath the world, and all around its great circumference. Repeatedly I was on the point of opening my heart to this plain man, and of asking him whether in all his world-wide wanderings he had anywhere found a religion more perfect than that of our ancestors. Every time, however, I checked myself. I was confident that he would not long remain in ignorance of my character and office; and how could I,

chief priest of my nation, betray to him such doubt as this my question would imply? I was too proud to place myself in such an attitude of personal inquiry. And yet perpetually this thought recurred: This man has seen cities and mountains, and rivers and peoples which you have never seen, and you feel no humiliation in being a learner in these things—why hesitate to ascertain if in religion he may not equally be able to give fresh light and information? At last I broke my proud reserve, and said: 'You must have seen something of the chief religions of the whole world as well. Now, which among them all, strikes you as the best?'

"'I have seen but one,' was the laconic reply.

"'What mean you?' I rejoined. 'You have told me of a score of peoples and lands and cities whose temples you must have seen, and whose rites you must have witnessed.'

"'There is but one religion,' he repeated.

"'Explain,' I demanded of him again.

"'How many do you make?' he said, evading my question.

"I paused a moment. I was about to answer: 'At least a larger number than there are of different tribes and peoples'; but in my hesitation I was struck by the strange agreement between his enigmatic utterance and my own previous conclusion that there could be but one perfect religion. Someway I yielded to the impulse to mention the coincidence. 'Do you mean,' I asked, 'that there can be but one religion worthy of the name?'

"My sacrifice of pride had its reward. It won an answering confidence, and unsealed the stranger's lips.

"'Have you time,' he said, 'to hear a sailor's story? More than sixty years ago I was born in a beautiful home hard by the base of our holy mountain, the Fusijama. This very evening I start to visit the scenes of my boyhood, after an absence of more than forty years. My father and mother were persons of deep piety, and from the first had dedicated me, as their first-born, to the service of the gods. At an early age I was placed in the care of a community of priests, who kept one of the chief

shrines of my native province. Here I was to be trained up for the same holy priesthood. For some years I was delighted with my companions, with my tasks, and with my prospects. But at length, as I grew more and more mature, and as my meditations turned oftener upon the mysteries of the world and of life, an inexpressible sadness gradually mastered me. I shrank from the calling to which I had been destined. I said to myself: "How can I teach men the way of the gods, when I know it not myself? How long have I yearned to find the way of peace and the way of virtue. How long have I cried unto all the Kami of Heaven and all the Kami of earth to teach it me. Yet even while I see the good I love that which is not good. I do myself the things which I condemn in others. I teach others to be truthful, but before an hour has passed I have lied to myself, have done or said what I had promised myself I would not. I love myself more than I love virtue, and then I hate myself because I love myself so well. I am at war within. Oh! who shall deliver me, who can give me peace?" As time passed on I became more and more the prey of this consuming melancholy. The time was at hand when my period of pupilage was to end and I was to be given the dignity of full admission to the sacred priesthood. The night before the day appointed for the ceremony my agony was too great for human endurance. Under the friendly cover of the darkness I fled from the sacred precincts of the temple, fled from the loving parents and friends who had come to witness my promotion. A wretched fugitive, I arrived at this very port which now stretches itself out before our eyes. Here I shipped as a sailor and sought the uttermost parts of the earth. Years on years I kept to the high seas, always choosing the ships which would take me farthest from the scenes with which I had become familiar. All great ports I visited, many a language I learned. Steadily I prayed the gods sometime to bring me to some haven where I might learn the secret of a holy peace within.

"'At last one day—I can never forget it—in a great city many a thousand miles toward the sunrise, a city which is the com-

mercial metropolis of the greatest Republic in the world, I was pacing, heavy-hearted, up and down a massive pier at which lay vessels from many a nation. The wharves were perfectly quiet; for it was a holy day. I was sadder than usual, for I was thinking of my useless prayers. I was saying to myself: "I am as blind as ever; as much at war within. So many, many years have I prayed and waited, and waited and prayed. The gods have neither brought me to the truth, nor the truth to me." In my bitterness I said: "The gods themselves are false! men's faith in them is false! There are no gods; there can be none. They would have some compassion; they would regard my cries." Bursting into tears, I sobbed out: "I cannot live in such a world! I cannot live! Let me but sink in death's eternal night!" And, as I sobbed out the bitter cry, the rippling water at the dock sparkled in my eyes and seemed to say: "'Come! Come! One brave leap only, and I will give thee peace!"

"'Just then a handsome stranger, arrested, perhaps, by my strange behavior, stopped, in passing, and spoke to me. In words of tender sympathy he asked my trouble.

"'Too weak to resist, I told him all. How beamed his face with gladness! "Come with me," he said. "This very day your year-long prayers are to be answered." I followed, and a few rods distant he showed me what I had never seen before, a floating temple which he had in charge. It was dedicated, I was told, to the great God. And when I asked which great god, the priest of the beaming countenance said: "Have you never heard of the great King above all gods?" Then he brought out a holy book and read to me these words: "O come, let us sing unto the Lord; let us make a joyful noise to the rock of our salvation. Let us come before his presence with thanksgiving, and make a joyful noise unto him with psalms. For the Lord is a great God and a great King above all gods. In his hand are the deep places of the earth; the strength of the hills is his also. The sea is his and he made it, and his hand formed the dry land. O, come, let us worship and bow down, let us kneel before the Lord our Maker. He is our God, and we are the people of his pasture and the sheep of his hand."

"'Then this strangely joyful man—Hedstrom was his name—told me that this great God did truly care for every man who truly yearns for inward peace. He said that he was a rewarder of all who diligently seek him, that he so loved the world that he gave his only begotten Son for the saving of all who want to be saved from sin, from self-condemnation and despair. He assured me over and over that this divine Son was both able and willing to save to the uttermost all who came unto God through him. I could hardly believe such tidings. I said, "You mean that all your countrymen who thus come to your patron God may find peace and divine favor?" "No," he responded. "I mean all—mean you—mean everybody whom this great Being has made to dwell on all the face of the earth; for, as the Holy Book says, there is no difference between the Jew and the Greek, for the same Lord over all is rich unto all that call upon him: for whosoever shall call upon the name of the Lord shall be saved."

"'"But do you mean that I can call upon him and be delivered from the load I have carried so many years?"

"'"Certainly."

"'"And be delivered now?"

"'"Certainly. Now, says the sacred Book, is the accepted time; behold, now is the day of salvation."

"'It was enough. Down I fell upon my face. Aloud I cried unto the great God. Through his Son I sought to come unto him. But, believe me, before I could well frame my words it was the day of salvation. My weary load was gone. My heart was full of peace and of strange new life. I knew that there exists a power which can deliver man and plant within him everlasting blessedness.'

"Gentlemen of the World's Convention, one word and the story of that wanderer is complete. That truant sailor proved to be my own elder brother, proved to be the long lost son, to fill whose vacant place my mourning parents had dedicated me to this same holy calling.

"My heart was broken with a double joy at this discovery.

And before we left that wave-worn shore the day of salvation had also dawned on me. To-day I can testify that a perfect religion is not a dream. To-day I possess and can give you its credentials."

Just at this point in the speaker's remarks the long-continued closeness of the atmosphere and the crushing pressure of the crowd proved more than I could bear. A certain dizziness came over me and I had to be carried from the hall. When I next came to consciousness it took me a long, long time to discover that I was safe at home in my study-chair, and that I was waking from a weird and wonderful dream.

Ladies and Gentlemen: You came here perhaps for counsel, for words of wisdom; you have received only a dream. Be not angry; it is not all a dream. To such as you its interpretation will not be difficult. The great world of civilization into which our generation has been ushered is an assembly hall vaster than that Meiji Kuaido, which stands in distant Tokio. Within it are assembled in earnest conference the elect spirits of every nation. About its doors hang millions of our humanity, conscious of their own lack of light and truth, awaiting the discoveries of their better qualified representatives. Within the highest, the never-ceasing debate relates to human perfection and to the means for its attainment. The ever eloquent debaters dwell now upon one phase or force, and now upon another; but the theme is ever the same, ever the perfection of human beings and the way to this perfection. Some are seeking a perfect industrial adjustment, others a perfect government, others a perfect social order, others—that they may combine and unify all—are in quest of a perfect religion.

For good or ill, dear friends, we all have received appointment as delegates to this World's Convention. Therein, some of us are called upon to speak, and all of us are called upon to vote in the presence of a hundred nations. Whether we yet realize it or not, we shall surely be compelled to speak and to vote for or against the perfect religion. The World's Convention insists on knowing what we can tell it respecting its

supreme problem. And we have to meet the demand in a publicity as wide as the world. The days of personal and national isolation are forever gone. Under the same roof with our vanishing American aborigines, within ear-shot of the moans of Africa, in full view of the cruel idolatries of Hindostan, in full knowledge of the hungry-souled millions of China, in the face of Europe's self-sophisticated and gloomy and scoffing agnosticism—in the hush of an Almighty Presence—we, each one of us, are going to tell the world what we know respecting human perfection and the road to its attainment. In doing it—whether we will or no—we will have to pronounce for or against the perfect religion. For or against! Which it will be I have little doubt. To ourselves we have long ago admitted that there can be but one absolutely true and perfect religion. To ourselves we surely have admitted that the perfect religion must present a perfect object of worship, that it must demand of man his highest devotion, and must promise to man his highest good. Long ago we must have admitted that the highest possible love should rule both worshipper and worshipped, and that this highest possible love necessitates closest possible union in some form of life, human and divine. I but utter your inmost conviction when I add that a religion consisting of supreme and mutual love between a perfect divine object and a perfectly responsive human subject can need no other credential than that which is given in its own uplifting and life-giving presence.

Christian brothers and sisters: Looking in your eager faces I am filled with gladness. You hold in your hands—in your hearts also—the one solution to all earth's problems. To you it has been given to know of the divine origin, the divine possibilities, the divine destination of this living mystery in human form. You know the path of deliverance from evil, and who it is that opened it. You possess ideals of human perfection, fairer, higher, broader than any of which ethnic sages have ever dreamed. You know of a life which even in its earthly stages is full of righteousness and peace, of love and good fruits. Publish it to the weary world. Exemplify it in church and

court and hospital, in school-house and in home. Count it the *prima philosophia*, the highest of all sciences, the finest of all fine arts. Let it be the one knowledge in which you glory, the one knowledge by which you seek to bring yourselves and all selves into glory everlasting.

Apostles of human perfection, apostles of the perfect religion, why should you not enlighten, why should you not emancipate the most distant continents? One sage of Asia, wise with a lesser wisdom, enlightened with a lesser light, has given ideals to millions.

Ye are sages more than a thousand strong. This day I commission you, I charge—in Christ's name I command you: Be ye in truth, as he himself has styled you, the light of the world.

And now, unto the Perfect Teacher of this perfect way be honor, and glory, and dominion, world without end.

FACTS AND FANCIES ABOUT HYPNOTISM.

BY MISS HELENA COLEMAN.

THE mysteries investing that gulf which has been forever fixed between flesh and spirit, and across which our thoughts come, like shadows from the mists beyond, have ever powerfully fascinated the mind of man. Every age and nation has burned incense before the invisible shrine of the soul, from the ancient Egyptian astrologer and Brahmin mystic down to our own generation, wont to regard itself as the clearest sighted, the most practical, and the least credulous of any. But even the scientific mind of our own sceptical age, although fain to ignore everything that cannot be measured or analyzed, and though having with its usual promptitude provided a variety of theories to account for any and every "manifestation" of doubtful origin, is yet itself not wholly free from interest in hypnotism and kindred subjects; nor incapable of being startled now and then by some unexpected flash of light from this nineteenth

century will-o'-the-wisp. Mystery is always fascinating, but doubly so when our own fate is interwoven with it.

Most of us are more or less well acquainted with the common forms of telepathy, as mesmerism, mind-reading, spiritualism, etc.; and while none of us, of course, believe in them, or would give them a moment's serious attention, still even the steadiest minded among us admit that now and then they "look a little queer." Such has been the general verdict upon the performances of an American who has been recently attracting attention in both Europe and America by his power of mind-reading —so-called, as the scientist invariably adds. Mr. Bishop's feats are of the usual tricky sort; the finding of hidden numbers, repeating acts done while he was absent, going to places secretly agreed upon by others, and similar achievements. A number of scientific gentlemen who lately subjected his operations to severe test and scrutiny, acknowledge that he is in the main successful, and that there can be no suspicion of intentional deceit in his methods; and accordingly give him credit for marvellously keen senses. For, "it is now very properly held by all qualified judges, that, when there is contact between the performer and the guide, there is no adequate reason to assume the occurrence of true mind-reading;" but in such cases the performance is called muscle-reading. It is, indeed, almost incredible to an ordinary person how keen the senses may be. The patient investigation, recently, of a perplexing case in France, when a lad could unhesitatingly tell the page at which a book was opened, though the cover alone was visible to him, revealed the astonishing fact that the number of the page was read from its reflection in the cornea of the eye of the investigator. When the eye was closed or turned away, in every instance the experiment failed.

The French nation has been the first in our own time to give serious attention and scientific investigation to telepathy in its various forms, particularly to the study of hypnotism; but the only results thus far have been a collection of very curious phenomena and a ripple of interest in the subject, which, though

more or less weakened by opposing elements, has spread over the greater part of Europe, and has even touched our own shores. That this ripple will shortly be followed by a wave of excitement which will sweep over the whole thinking world, and break down or greatly modify preconceived views of the relation of our mental and physical natures, many confidently expect. Nor would such a movement be surprising, for it would be but a natural reaction from the dry dust of materialism with which men have been trying to feed themselves, and would give license once more to the free play of imagination; but that it would result in any real service to mankind, as its enthusiastic devotees claim, may be justly regarded as something more than doubtful. Among the possible benefits to accrue from increased knowledge of "the complex field of thought-transference," are one or two calculated to strike the unfamiliar mind with anything but reassurance. One of these benefits is the power of artificially readjusting man's mental machinery and regulating his moral nature. That this has been actually done, and with unquestionable benefit to the patient—victim, I was about to write—it is said there are many "priceless living documents" to testify. Several instances of the kind are recorded by a writer in a late number of that eminently respectable and staid review, the *Nineteenth Century*. I will quote the shortest of these cases: "In the summer of 1884 there was at the Salpètrière a young woman of a deplorable type. Jeanne Sch—— was a criminal lunatic, filthy in habits and violent in demeanor. M. Auguste Voisin, one of the physicians on the staff, undertook to hypnotise her on May 31st, at a time when she could only be kept quiet by the strait-jacket, or perpetual cold douche to the head. She would not—indeed, she could not—look steadily at the operator, but raved and spat at him. M. Voisin kept his face close to hers, and followed her eyes wherever she moved them. In about ten minutes a stertorous sleep ensued; and in five minutes more she passed into a sleep-waking state, and began to talk incoherently. The process was repeated on many days, and gradually she became sane when in the trance, though

she still raved when awake. Gradually, too, she became able to obey in waking hours commands impressed on her in the trance —first trivial orders (to sweep the room and so forth), then orders involving a marked change of behavior. Nay, more; in the hypnotic state she voluntarily expressed repentance for her past life, made a confession which involved more evil than the police were cognizant of (though it agreed with facts otherwise known), and finally of her own impulse made good resolves for the future. Two years have now elapsed, and M. Voisin writes to me (July 31st, 1886) that she is now a nurse in a Paris hospital, and that her conduct is irreproachable. In this case, and in some recent cases of M. Voisin's, there may, of course, be matter for controversy as to the precise nature, apart from hypnotism, of the insanity which was cured. But my point is amply made out by the fact that this poor woman, whose history since the age of thirteen had been one of reckless folly and vice, is capable of the steady, self-controlled work of a nurse at an hospital, the reformed character having first manifested itself in the hypnotic state, partly in obedience to suggestion and partly as the natural result of the tranquilization of morbid passions."

Some have suggested the impropriety—nay, sin—of meddling with the poise of a soul, and to them the reply is made, "Those of us who have been well drilled in childhood are not apt to consider that the advantage thus gained for us was an unfair or tricky one, nor even that virtue has been made unduly easy to us, so that we deserve no credit for doing right. It surely need not, then, be considered as over-reaching destiny or outwitting the moral law, if we take persons whose early receptiveness has been abused by bad example and try to reproduce that receptiveness by a physiological process, and to imprint hypnotic suggestions of a salutary kind." A reply that is more clever than satisfying.

Another benefit which it is claimed we may derive from hypnotic treatment is the relief from some forms of unnecessary pain, as neuralgia, which does not betoken the existence of

dangerous disease, but which, apart from the needless suffering it causes, is injurious to the organism, and prevents mental concentration. Anxiety, also, and intellectual fatigue, and the thousand petty cares and distractions inseparable from our present mode of life, may be obviated by the simple means of an artificial state, "which shall be as waking but without its uneasiness, and as sleep without the blankness of its repose, a state in which the mind may go serenely onward and the body have no power to distract her energy or to dispute her sway." To the objection which at once arises, that such tamperings with the very personality of man are morbid and unnatural, if not positively dangerous, this ingenious writer in the *Nineteenth Century* answers, "Which state, then, do you consider as unnatural, your ordinary sleep or your own ordinary waking?" and goes on to argue that this hypnotic sleep is but an abridged means of obtaining that intellectual freedom with bodily repose which we seek in anæsthetics, but without the injurious effects of the latter, and with "almost uniformly good results." What may lie behind that *almost* we are not told, but our imagination can easily fill the blank when we remember the fact that hypnotic treatment tends to weaken will power, and in some cases to disarrange that complex and delicate machinery which is the ego's only means of knowing and making known.

One suggestion, and one only, of a good that may be effected by the agency of hypnotism seems to me to claim consideration, and that is as a possible aid in the diagnosis and treatment of a certain class of morbid diseases, as hysteria and some kinds of epilepsy and insanity. If, by its means, nervous centres can be reached and soothed; if the violent can be quieted, and the sufferer eased with no fear of evil results, then, truly, hypnotism will take no mean place in the long list of blessings which our nineteenth century has given to the world.

Most persons are susceptible of being pleasantly soothed when the hair is gently brushed or handled; some are similarly affected by a succession of vibrating or rhythmic sounds; and others again by the repetition of some easy motion, as in the

case of a lady I once knew, who, after a few minutes' gymnastic exercise of a gentle kind, became tranquil and sleepy; and there is little doubt but that the same influence is at the root of our habit of rocking children to sleep. That these sensations are allied to hypnotism—are, indeed, a mild form of it—seems to me very probable; and the suggestion is strengthened by the fact that susceptibility to such influences varies in individuals, such as the susceptibility to true hypnotism varies, some people being totally insensible to mesmeric power.

The majority of us, while cheerfully admitting that we *might have been* "constructed upon an improved pattern," will, no doubt, be willing to confine our personal acquaintance with the method by which "we may be fused and recrystallized into greater clarity" to such simple phenomena as those just indicated, or would prefer to study the effects of the "spontaneous readjustments of man's being," as displayed upon someone else, than to experience them ourselves.

Whatever place or shape hypnotism may come to take in the world's progress; whatever relation it may bear to man's happiness or well-being, it is impossible to predict; but of one thing we may be assured, it will never clear away the mists which surround us; it will never answer those questions with which men have wrestled since the world began: What, whence, whither? It will never make gods of us.

THE best way to bring a clever young man, who has become sceptical and unsettled to reason, is to make him *feel* something in any way. Love, if sincere and unworldly, will, in nine instances out of ten, bring him to a sense and assurance of something real and actual; and that sense alone will make him *think* to a sound purpose, instead of dreaming that he is thinking.—*Coleridge.*

THE Earth with its scarred face is the symbol of the Past: the Air and Heaven, of Futurity.—*Coleridge.*

NATURE AND POETRY.

AN INAUGURAL ADDRESS DELIVERED BEFORE THE SCIENCE SOCIETY BY THE PRESIDENT, W. W. ANDREWS, IN FARADAY HALL, VICTORIA COLLEGE, ON THE EVENING OF THE 19TH OF JANUARY.

EVERY man has his own theory of the world. With the first stirrings of conscious life the child becomes possessor of a theory of the world and a belief which, slim though it may be, governs his life. He believes in the existence of the outside world and himself is real to himself. Added years but add many-sidedness, definiteness, and range to this possession.

Some would-be practical men look with scorn upon the philosophers with their theories, and the poets with their visions, yet these men, with the outlook of the cellar and the street, have their own theories, which differ from the theories of those who look from the heights of philosophy and poetry, only in being narrower and less trustworthy. Both believe something concerning the objects they see, and this belief is the envelope of their theory. If ever there was a time in which the necessity of theorizing was laid upon men it is to-day. The simple faiths of childhood have been shattered and its beautiful dreams demolished. Almost everything that we esteem as truth is an achievement resulting in the reversing appearances. The sun used to rise in the flashing east and fill the long days of childhood with its light, and then set among the splendors of the west, while the solid earth was the centre of the world—and the child-heart trusted the vision of the eyes—but Science, the angel with the measuring rod, has dispelled the illusion, and now we try to feel at home on a whirling ball swung at arm's length around the motionless sun, and the grand, the all-important earth has shrunk into a mere speck among the mighty stars. The glorious cloud, whose fleecy buttresses were such a joy in other days—a perfect fairyland of wonderful form—we now know is nothing more than a mass of cold, damp mist. Matter, once so still, understandable, dead, has become a restless thing, full of energy, full of mystery. Out of every

resting place we have been driven. "Things are not what they seem." Seeming is not being, seeing is not believing, thinking is not knowing. Our age is so science-soaked that most of us are almost ready on second thoughts to take improbability as a reason for faith. We all ask, What is truth? We know there is such a thing; we hope it is for us. There, always just before us, is the unattained goal, and in our efforts to reach it we have all become possessed of theories. Theories are our attempts to reach the truth. Part of the essay to-night will be the propounding of a theory, part the proclamation of a faith.

The truth, however, is not everything. The intense fact-thirst characteristic of our times deludes many with the idea that truth is an end instead of a means. A fact is *for* something. Its value is in its utility. A chemist discovers a new fact regarding some element with which he has been working. That fact is of no value to him except as a usable thing. It brings him into more intimate relations with that element. Now, as never before, it will respond to his efforts—it will answer his prayers.

We all feel that any fact of science, any deduction, any theory, is of little value when compared with a grand emotion, a noble act, a devoted life. These moral values imply personal relations, which must therefore be higher than all others. If truth has any value it must be because it brings me into more intimate relations with some reality, some intelligence. If I am told that I must do right because it is a law being laid upon me, from which I cannot escape, or that because virtue tends to the perfection of my nature, that therefore I should practise virtue, I still ask why should I obey the law and why should I seek the perfection of my nature? Only one supposition is possible, that by following these indications I come into more intimate relations with some portion of reality, some being who by the worth, the love, and blessedness of his character has a right to say to me, "Come." No external fact. no external standard can compass the meaning of life. The highest relations in the

universe must be personal—the relations of living intelligences. All must be judged by the highest.

All fact, all truth, must be of value to us only as it is of use in disclosing these relations and in helping us to fit ourselves for the fellowship of knowing that Being who fills our highest idea of existence and whose inner life, we are constrained to think, is the blessedness of love. This discussion, then, is not a matter of mere curiosity. It has a moral worth.

Poetry is the output of that human faculty which reads out of Nature its meaning, conceived as beauty. To the eye of the poet all is beautiful because he is conscious of a life pervading all things. All Nature speaks to him. Whispered meanings make flower, man, bird, star, mountain, and lake endlessly eloquent. Books his anointed eyes find in running brooks, he hears songs in the night winds, and his heart feels a presence in every silence.

In the delivery of his message to the world he may use melody of words and metrical arrangement, but these are not essentials.

Poetry is interpretation, its secret is sympathy, its instruments are pictures, symbols and melodies, its inner nature is personal communion, and its end the conservation of all that is divinest and noblest in human life. To the poet Nature has the unity of a personality. It is Nature—his friend—with whom he communes. A reputed son of Lord Byron (Richard Realf) sang in words which express this close personal relation

"A dreaming poet lay upon the ground:
He plucked the grasses with his listless hands;
No voice was near him save the wistful sound
Of the sea, cooing to the unbosomed sands.

"He leaned his heart upon the naked sod;
He heard the audible pulse of Nature beat;
He trembled greatly at the Word of God,
Spoken in the rushes rustling at his feet.

"With inward vision his outward sight grew dim:
He knew the rhythmic secret of the spheres;
He caught the cadence, and a noble hymn
Swam swan-like in upon the gliding years."

These words, without this deep sense of personal relationship to Nature—this feeling of personality which I regard as the essential element in the poet's mind—are rhapsodic nonsense. Him we recognize as the poet who can so describe human life and Nature that they are no longer to us painted shows—who makes vivid to us the truth that lies behind the form, and causes us to feel the presence of a world of thought and feeling similar to that of our own hearts—whether it be Homer, Shakespeare, Dickens, Wordsworth, Scott, or Ruskin. The man who can so describe some grand natural scene that, reading or listening, we are possessed by the same emotion we had when we gazed upon the thing itself, may lay claim to the poet's power. When we analyze that impression produced alike by Nature and by the description of the poet, is it not the impression of a soul speaking to us? Who has ever looked upon the storm clouds rolling up in black, muttering masses, or upon the restless waves breaking with giant force against a trembling pier, without investing these things with personal attributes? The anger of the storm, that was its sublimity; the power, and reckless, human-like persistence of the waves, these constituted its grandeur. We waited in strange fear till the storm had spent its fury, and we saw the wave beat against the spiked timbers again and again and again, only to be broken, and to turn with a moan away, until we felt a true human sympathy for it in its failure, or we trembled for the pier beset by such tireless enemies. In all such moments we have the true poetic feeling, and our emotions are exactly similar to what they would be if human beings, and not insensate things, were the object of our gaze. When Nature deeply impresses us, this is always the result.

Poetry ever has about it the glow of soul and life. All the poets who treat of Nature treat it as a living thing. To Homer the deep, whirlpooled Scamander was a living being, waiting to swallow up Achilles. In his poems the vivid touch of life is everywhere. Dwelling most on human life, he brings out by similitude the force of human feelings, and thus acknowledges the kinship of the human and the natural. The presence of

Nature is felt in his descriptions. Once, when Achilles, long absent, returns to the conflict, he pictures the gods, heaven and earth, mountains and rivers, the sea and the under world, as stirred in sympathy; for Homer felt the fellowship of Nature. The Hebrew poetry never looks on Nature as an existence apart. It is the garment of Jehovah, the thin veil through which he is ever ready to burst. There is no distinction between the natural and the supernatural—all is the immediate action of one personal power. This conception humbled them, and their descriptions of natural objects, on account of their reverence, were truthful and exact. They felt no need of exaggeration. Jehovah was the principal thing. Religion and poetry became one. The world of Hebrew poetry was alive with thought and will and feeling. So grand and direct was their view that they lost some prettier glimpses possible to other nations through short-sightedness. Directly opposed to this conception is that of Lucretius, who conceived of a dead mechanical universe—the result of the play of lifeless atoms. Now and then, however, the true poetic vision comes upon him, and with a pathetic eagerness of devotion, an almost prophetic awe, he described "the great elemental movements of Nature, and when the storms and winds were up" he caught the feeling of fellowship and felt himself to be "one among the many there." The vision of a vast world informed with life took the place of the dead mechanic world of his theory, and with the true enthusiasm of the prophet and poet, he felt the life and soul of Nature whence comes its unity. Of Virgil's sympathy with Nature and its all-pervading life I need not speak.

But, passing to moderns, notice that Chaucer has a child-like love, which, in the presence of Nature, is happy as with a friend, and asks no questions as to the secret of her life. She is his, with the month of May, and that is enough. From him to Wordsworth, the poet of the poets, is a long way; but if our definition be correct, Wordsworth has drunk most deeply of the poetic spirit. Perhaps others have felt as deeply as he, but coming upon the world when he did, and having the intellectual

history he had, he was best fitted to express this deep personal relation to Nature. In his school days, when light tasks gave him time for rowing on the lake, skating on the ice, climbing over crags, and roving in the woods, Nature began to fill his mind, he tells us, "with images sublime and fair." Later years let him into the secret, and he looked upon Nature to be but the organ of intercourse with man:

> "Established by the Sovereign intellect,
> Who through the bodily image hath diffused,
> As might appear to eye of fleeting time,
> A deathless spirit."

If imagination is the faculty of the poet's mind, he considered its function to be what we have come to regard it in science, the power to see things as they *are*. The poet was a seer who saw something because he looked deeper than other men, and where there was something to be seen, and out of his own vision grew his love:

> "This spiritual love acts not nor exists
> Without imagination, which in truth
> Is but another name for absolute power,
> And clearest insight, amplitude of mind,
> And reason in her most exalted mood."

The result of his seeing was this, that if earth and heaven should pass away something would still abide:

> "Yet would the living Presence still subsist
> Victorious."

What we find in Wordsworth we find in common men whenever they are brought face to face and heart to heart with Nature; we find it in the trivial spirits of the artificial school, in the materialistic and naturalistic poets; only, in Wordsworth we find it more perfectly developed, more articulately expressed, and more directly applied to the interpretation of Nature. In his communion he had the feeling which we have in deep converse with friends:

"I was only then
Contented when, with bliss ineffable,
I felt the sentiment of being, spread
O'er all that moves, and all that seemeth still,
O'er all that lost beyond the reach of thought
And human knowledge, to the eye
Invisible, yet liveth to the heart."

Cowper, Thompson, and Burns fully shared this with Wordsworth. With them, however, it was less philosophically conceived, analyzed less, but felt as much, With Burns, who did more than any one else of his time to bring men into sympathy with Nature and who revealed Nature's sympathy with man, it was not a pensive contemplation, but a thrill of delight, the very rapture of love. He had no theory, but he had an experience—so intense that it vibrated between ecstasy and tears. Lastly, let us take another example from Wordsworth:

"*I have felt*
The presence that disturbs me with the joy
Of elevated thoughts. The sense sublime
Of something more deeply interfused,
Whose dwelling is the light of setting suns,
And the round oceans and the living air,
And the blue sky, and in the mind of man
The motion and the spirit that impels
All thinking things, all objects of all thought,
And rolls through all things."

Let any one with this hypothesis in mind turn over the pages of Tennyson, Shelley, Swinburne, Longfellow, Byron, and Browning, and note how, especially in their finest passages, this sentiment of being and life is reproduced, and in what an infinite number of degrees and forms. The constant instinct of the poet is toward personality.

Now we come to the question, whether this poetic vision is indeed a true interpretative power? Is there any guarantee for thinking of Nature thus? Is it indeed instinct with life? Is there a soul behind its face? The poets bow before her with a strange reverence, due to no soulless thing. Are they dupes of their fancy, or idolaters? Is he alone the sane man to whom a

blade of grass is only a streak of green, and the soft blush of the rose only a patch of pink. And must we regard the poet's "eye with fine frenzy rolling" but the symptom of an insanity?

On the basis of the law of organic structures, that every organ has its correlate, we may regard the poet as a seer and not a dreamer merely. The poetic faculty must have its correlate. This poetic spirit has certainly earned its right to be regarded as one of the natural endowments of the human soul. In the earliest days it clothed natural facts in a garment of myth, and personal agencies were found everywhere. Every fountain and grove had its genius, and every shadow was haunted. The child in his wonder and the savage in his fear are never companionless. The mystic dreamer and the philosopher walk together in the peopled world of the poet. Plato was but the myth-making man made larger. Aristotle was the same man made more exact. These were children and primitive men with wider vision and better knowledge. The same element spoke in all. To these the universe was a world of mind. It was luminous with intelligence. It was not now the spirit with the evil eye haunting a cave, nor the pretty goddess of the fountain, nor a deity among the hills: it was the Omnipresent νους, governing all and revealed through all; and their philosophy rose to the level of poetry when their hearts *felt* this as a personal presence.

There have been poets who have not risen above the instinctive stage, who were ruled by this faculty, interpreted life and things according to its light, and invested all with the charm of personal attributes, without rising to an intellectual expression of what their feeling implied of the Universal Presence whose manifestations were so manifold; and there were others who found intellectual form for that which lay capsulate in the raptures and fancies of the former class. Without insisting on the classification of names, among the former we may place Burns, Homer, Chaucer, and perhaps Shakespeare, who, in unreflecting mood, loved Nature and listened with their hearts to her whispers. The other class comprise such as Milton, Cowper, Shelley,

and Wordsworth. But in all the range of heart-vision, from the child to Plato, and from the dweller in the woods to Wordsworth, there is one undeniably human faculty operative, instilling into human life all that makes it worth living, glorifying it with captivating beliefs, enlarging its boundaries, multiplying its unutterable emotions, and peopling all its inner heaven with towering ideals which are the light of life and the high thoughts of the Author of our being concerning us. Some one has said, "The distinguishing endowment of the human mind is the capacity of becoming conscious of the infinite"; and this is one form of that endowment. Undeniably, we have some such faculty, of which it is true, as it is of the conscience, that not only do we have it, but it has us.

We find the law of correlation wonderfully illustrated in the human organization. We have the eye, and there, pouring in long, swift sheaves of quivering arrows, from all parts of the starry heavens, is the phenomenon of light to match it—the ear and the wonders of sound to match it. The mathematician may sit down and construct, out of pure intelligence, a universe of mathematical relations, and then, turning to the outer world, find that his problems are there worked out in a universe, mathematical in every atom—so wonderful is the correlation between the faculties of the human soul and the outward reality. Can we think that there is not some portion of reality standing over against the poetic faculty as its correlate, which can report itself through no other faculty?

If we accept the hypothesis of the theory of evolution, that faculties have been developed by the action of environment—that the eye, for example, was formed by the beating of light upon some sensitive part of a living organism until, first, the eye spot, and, after long ages, the perfect eye, as we have it in the higher animals, was developed—we must ask what portion of our environment has developed this wonderful faculty in the human soul? Its very existence is the evidence of its truthfulness. On this hypothesis we are under double obligation to listen to its deliverances.

Again, the wonderful similarity of the feeling we have when we are in the deepest communion with Nature, and that we have in listening to eloquent speech, when a flaming soul is burning its convictions and enthusiasms into ours, points to a likeness in the causes. When a great musician stands before an audience ready to perform, by no means, if he is a master, does he stand there with an empty soul. A whole ocean of conception and feeling is ready to sweep over his soul as soon as he gives the signal. He opens the flood-gates. The air is made tremulous with the music, and then, strange phenomenon, a like ocean, with all its waves and tumult, is rising in the hearts of his hearers. The feelings which swept their hearts were not due to any projection of human qualities into the music, on their part at least. Through the agency of physical vibrations soul had spoken to soul. The conception and feeling which moulded the music were the real music. Heart answers only to heart, and soul to soul.

We have found that matter moulded into certain forms has power to move us to longing and to tears. It can, in sculpture and painting, music and oration, apprise us of unsounded depths in our being, and calls into intensest life all the elements of our personality. But everywhere it is soul moving soul. Nature has the same power. Can it be that this effect in the case of Nature is merely an echo of our own voice coming back to us any more than it is in art? Is not Nature God's art? And is He not the Artist whose feelings and conceptions, in part, flow into us and disturb us with the joy of elevated thoughts, grander conceptions of life, destiny, and the world? Religious people are ready to admit that in conscience God reveals some of His thoughts, and that there we have the revelation of a power that makes for righteousness. If we acknowledge Him in the deliverances of the conscience, we must acknowledge His presence in the revelations of poetic spirit.

But the deliverances of the poetic spirit are not absolute revelations. The poet may, with the myth-making man, grasp this one essential truth, that Nature is living, not dead; but

the intellectual expression of it may be at fault, and the simple intuition of the heart be loaded with a mass of error. These deliverances must be analyzed, stripped of all false accretions, and tested in the light of other truth. The poetic spirit, then, is a heavenly messenger bringing plastic material to be worked up in the mills of science and philosophy. It may reveal a fact. Science must tell us how it came about, and philosophy must seek the why. Only when we use the poetic faculty thus can we have any confidence that we are making it an organ of truth. Just so ought science to be tried in the light of poetry and philosophy. No theory which flatly contradicts the poetic instinct can live.

In support of the trustworthiness of the poetic mind as an interpretive power, it may be noticed:—

1st. That all the great poets are remarkable for their absolute fidelity to Nature in their descriptions. They saw the outer form truly. That is a good beginning.

2nd. That consciousness witnesses to the poet's truthfulness. None of us feel, when a true poet has described a scene on which our eyes have often looked, and has taught us to see new beauties in it, that we have been deceived. We bless him for the new truth and berate ourselves for our own stupidity.

3rd. Many of our best working hypotheses and most satisfactory generalizations in science were at first poetical fancies, which investigation has proved to be true: for example, the doctrine of the metamorphosis of plants, of the homologies of the skeleton, and of the plan of God in the world, and perhaps of the conservation of energy. Science has long found true many of the dim foreshadowings of the human heart. The sun was worshipped as father by man in his simplicity; and science tells us that the force which keeps our hearts beating comes from the sun, and the earth herself is his child, with something of the ardor of the father's heart still raging in her breast. We find also that the most fruitful minds in science are those in whom the poetical faculty is strongly developed. This is true of Faraday, Agassiz, Darwin, Tyndall, Kepler, and Newton. It gives

to the investigator far-reaching vision, quick perception of the meaning of long lists of dry facts, and a sense of awe, companionship and trust, which steadies the heart, alike in moments made glorious by success and in long, resultless hours of faithfullest labor. Many parts of Darwin's "Origin of Species" read like a poem. Nature—selecting, crushing, nursing, moulding, planning for future contingencies, exhaustless in device, and remembering the past—is the name of the personal element which broods over the book and gives to it the charm of poetry.

4th. Science is now justifying the belief, heretofore only poetic and religious, that we are everywhere surrounded by a supersensuous world. Huxley has said that the unseen universe—the world of law and force—is more real to us, and we know more about it than we do about the visible and tangible world.

Passing by that rational view that the universe is a vast design answering some great purpose—which is a possible poetic view, though generally too purely intellectual to be called poetic—let us pass on to study another element in Nature. Three things science delights in—law, force, matter. The most commanding reality in the world to the scientist is law. Its work is seen, its presence felt everywhere. We cannot violate it without being punished, nor can we fulfil its conditions without being blessed. It rules in the seen, and in the far vaster realms of the unseen, physical universe. We cannot escape from its power nor fly from its presence. It is omnipresent, like the Deity. Nothing is too great, nothing too minute, to be caught and held in its meshes. While all else is in a constant flux, law and force remain two ever-present, never-changing phenomena. The first lesson of science is obedience. How shall we define law? As the determination that forces shall act in such and such ways, and in no other. There is only one thinkable source of law, and that is in *will*. Of one thing we are conscious, that we can *originate* motion—we can *will*. One great philosopher has said that "will is the only germinant thing in the universe; all else is flow." Notice that when we will, we always will in a

particular way—that is, we determine that the force we exert shall act in such and such a way. We impose a *law* on our action. If we will to speak, it is to pronounce certain words. The expression of force and its law spring into being at one and the same moment.

Some scientists believe that in certain nervous states the mind of man has power to move physical objects without physical touch. For instance, if I have upon this table a piece of paper, I could, by exertion of will, make it move toward me. Whether that is true or not, something analogous takes place every time we move a finger. Our brains are made of matter just as truly as this paper. The brain is no part of me, of my real self. It is as much external to my mind and soul as the outside world is. Yet, when I will, these brain cells—groups of atoms—quiver, a vibration is sent along a nerve, and my hand moves. Will, spirit, has moved matter. Returning to the piece of paper: Suppose that while I hold it in my hand someone from the audience should be able to exert his will upon it so as to move it. I would feel a pull upon it. *But I do feel a pull upon it.* I say it weighs so much. Is this pull the pull of a will? Some say it is. Dana, Sir John Herschel, Faraday, Berkeley, Hartmann, and scores of others, think it is. This force is found wherever there is matter. Between every grain of sand on the lake shore and every snowflake resting on yonder hills, and the highest planets and the farthest stars, this pulling is being exerted, acting instantaneously at the greatest distances, and binding the whole universe together in one vast brotherhood. Again, the force exerted on the paper continues only so long as the person whose will moves it continues in the act of willing. If the force of gravitation is due to the action of the will of God, that will is acting now; and he who stands in the presence of a falling body stands in the presence of an expression of the present will of God. As one of our great thinkers has said, "wherever natural law presses upon us we feel the touch of a personal God." But if we adopt the common scientific view of matter, we come to ultimate atoms,

between which there is no matter. Physical forces act only through matter. What but spiritual forces can span the interval? Between these atoms and across these spaces forces much more powerful than gravitation are exerted. Are these, *too*, the expression of will? Suppose that I had here, in a given space, a large number of atoms as susceptible as those of my brain to the influence of my will. I may place them. I may determine that they shall act in certain ways toward each other, just as I am able to determine that an atom, or a group of atoms, in one part of my brain shall move and produce a motion of a hand, and then to determine that an atom in another part shall move and produce a movement of a foot. So in this space I can impart energy to the atoms, and by my will conserve it; and so I may determine laws, forces and motions for these atoms; and then all the properties and phenomena which we find in matter might be manifested, such as extension, solidity, form, color, heat, etc. But why need I begin by supposing the existence of dead, inert atoms as a basis? We want to account for the material universe as we know it. We only know matter from the impression it makes upon our senses. All the impressions received from matter are, at first, movements at the end of a nerve. If spirit can move matter at one end of a nerve, it can at the other. And thus that Spirit whom we call God may, on lines along which we work every day, create a physical universe by willing that certain mathematical points shall be the centres in which His will shall express itself in certain determined ways; and the impressions made on the senses—the nerve ends—of beings constituted as we are, could be just what we find them to be. This lands us in the safe position of Berkeley, that we only know matter as force, force as will, and will as spirit. Matter is real: not as some would have us suppose, a something created by God and now existing in and of itself, but pillowed every moment upon the everlasting arms of Him who upholdeth all things by the word of His power, in whom all things subsist, and in whom we "live and move and have our being."

"Closer He is than breathing, and nearer than hands or feet."

Who of us have ever thought of the world as anything else than an expression of God's thought and will? We can think and write the signs of our thought in a book, and we can make a machine to perform our will, but in doing that we have used the materials of a created world which is outside of us. God had nothing to fall back upon, the materials of which might be made to be the signs of his thought. His own thought and will must be made the basis of all things, but a thought is a thought only as it is being thought, and a volition is a volition only while being willed. These things live only in an intelligence. Therefore if this universe be a thought of God He must be *thinking* it; if it is the effluence of His will, He must be willing it *now*. Should His thought and will cease, this universe would be—nothing. Thus in matter we have reached one form of the supreme reality.

> "The Living Will that must endure
> When all that seems shall suffer shock."

Once, having discussed this theory with one of the most original minds in Canada, he said, "It is hard to think that what are to us disgusting forms of matter should be forms of the expression of God's Will." A few days after we spent several hours peering alternately at the wonders of life and color revealed in the water from a stagnant pool, and when we had finished he said in a tone of deep conviction, "There is no such thing as dirt in the universe." The latter vision is the truer one. One of Germany's calmest and deepest thinkers has made the statement that "behind the tranquil surface of Nature, behind its rigid and regular habits of behavior, we are forced to seek the glow of a hidden spiritual activity."

If this view be correct, then by science and philosophy the poetic vision is justified and its essential deliverances are sanctioned. Matter is not the dead, cold insensate core of a world of beauty, but an expression of spirit. God acts in regular, constant ways that we may learn of Him, that our Keplers may feel when new visions may flash upon them that they are thinking God's thoughts after Him and with Him, that it may

be possible for a Newton tracing out the paths of this constancy to cry, "Glory to God who has permitted me to catch a glimpse of the skirts of His garments. My calculations have encountered the march of the stars." It is this constancy which makes matter seem so solid and indestructible. The very regularity of the universe hides its life. The highest and last lesson of science is trust. If this be our view of the world, then it is a temple. Matter is sacred. The laws are holy. The study of science is a reading of Scripture, the natural is supernatural and God is all in all. Not Pantheism, but Theopantism, is the faith that most illuminates the world.

The magnificent sweep of a winter's storm, the music of the streams in spring, the singing of the rain falling on the trees in June, the beauty of the grass and the splendor of the flower, the magnificence which covers the autumn hills—the burial splendors of a whole year's vegetation—Nature's many and mysterious voices, her unwavering fidelity to her promise, the simple grandeur of her movement, the vastness of her designs and the sublimity of her ways have a new meaning to him who lives with this conception. Nature, then, is all poetry.

It is hard to see how, with the grand visions which science has made familiar to the modern imagination, the poetic sentiment amid so much boundlessness and mystery can have any other destiny than finally to merge itself into the religious.

The mission of poetry is to catch those subtle elements which escape the physicist and the chemist and to save us from that grossly mechanical view of the world which reduces the soul to the vibration of a molecule, and which, to borrow the words of Richter, "considers the universe to be an automaton, God the uniformity of physical law, and man's future a coffin." As long as poetry keeps alive for us those sentiments and feelings which are the bloom and fragrance of our personality, and the sense of a Presence in Nature, feeling an interest in man and rejoicing and suffering with him, the wine of life will not be poisoned, nor will materialism put our civilization under the bars of death.

The true poet is the high-priest of Nature. It is for him to handle the things of the sanctuary, to stand in the Holy of holies and to hear voices and see visions denied to all else. His office is sacred, his message a revelation and his words are inspired. This is the man who moves the ages. Subtlest atmospheres are his nutriment, ethical convictions the strength of his soul, eternal love the burden of his song, and the presence of the Infinite One the glory of his vision, for

"God, God, God is the only Muse."

EVOLUTION OF THE ELEMENTS.

BY PROF. A. P. COLEMAN, PH.D.

ONE of the most striking features of modern thought is the tendency to find everywhere continuity instead of the sudden jolts and cataclysms that interrupted the machinery of the universe, according to former views. Whether it be in the use of the infinitesimal calculus in mathematics, or of the theory of development in botany and zoology, we prefer to pass by insensible gradations from one point to another, rather than to regard facts as stepping-stones over which we must pass by a succession of leaps.

One of the most interesting evidences of this modern tendency is to be seen in Crookes' discussion of the origin of the chemical elements. From time immemorial men have philosophized as to the nature and number of the elements, but usually with more satisfaction to themselves than advantage to the science of chemistry.

Up to the present we can only say with certainty that a considerable number of substances cannot be reduced to any simpler form by means at our disposal, and that provisionally we call them elements. The list of such substances already reaches 70 or more, and is almost every year increased by new discoveries.

Probably most chemists, from theoretic reasons, as well as the

spectroscopic work of Lockyer, Crookes, and others, regard the supposed elements simply as very stable compounds which might be decomposed under proper conditions—for instance, in the intense heat of the sun's atmosphere.

The wonderful "periodic law" of Mendelejeff, by which the elements are arranged from the lightest to the heaviest in accordance with the relative weight of their atoms, brings to light a series of groups or families as naturally related to one another as the species in a family of plants or animals.

The elements are often and rightly described as "manufactured articles"; let us say, coins, arranged in a series where each is slightly heavier and slightly more valuable than the one before, but all struck from the same material. The uncoined bullion of the elements Crookes terms "protyle," and supposes that it formed the original intensely heated nebula from which our universe evolved. As cooling progressed in accordance with the well-known nebular hypothesis, the point of dissociation for one element after another was reached till the original "world stuff" was all exhausted.

To judge by our own little earth, the elemental coins were by no means struck in equal amounts, for one of them, oxygen, makes up nearly half the weight of the whole, while several of the metals are exceedingly rare. This may, however, be reversed in some other part of the universe, and we should beware of judging too positively of the whole immense circle from our minute segment.

A manufactured article, says Crookes, implies a manufacturer, a raw material, and probably also by-products or residues. If so, may we not look on the groups of rare metals, such as Samarium, Erbium, and Didymium as residues?

Another and more startling suggestion is made by Crookes as a result of his long-continued analyses of the rarer earths; viz., that the atomic weight of an element is simply the *average* weight of its atoms, which vary slightly from one another in weight and hence in properties. If this suggestion should be borne out, the resemblance of the groups of elements to groups

of organic species with their minor races and varieties is much increased, and the almost universally accepted theory of the evolution of living species may perhaps be extended to cover the inorganic world as well, though of course in a modified sense.

So far as our feeble eyes can see, the Great Manufacturer followed a uniform plan in His work—a plan which we are only beginning to comprehend, but one that included forethought for the life of the world. Why else were the more useful elements, such as oxygen, carbon and iron, prepared in so much greater amounts than the less useful ones? Had oxygen been less abundant, it would long ago have been wholly withdrawn from the atmosphere to form various compounds, and life as now constituted would have been impossible.

JOHN MILTON.

BY E. S. C. HUYCKE, B.A.

THERE have appeared at different intervals in the world's history minds so anomalous in their nature and complicated in construction, that they have seemed more like errant spirits from the world beyond than those possessing the attributes and propensities of ordinary mortals: and foremost in this long and favored list stands John Milton, the poet, the patriot, the glory of English liberty and the pride of English patriotism.

Grand, gloomy, and majestic, a man whom many praise, but few understand, the subject of the highest panegyric, and the fiercest and most bitter invective, John Milton was pre-eminently a genius, and a genius of the highest order. Genius is said by one to be humanity raised to a higher level, and its possessor capable of more intense feeling, a purer joy and deeper sorrow than his fellow-men. As the lark rises against the rosy ceiling of the day far above the emulation of his rival songsters, so the genius soars away into the ethereal heights of heaven in his glad joyousness, till no earth-bound spirit can follow.

But the brilliant imagination of Milton is never allowed to

play uncontrolled by his will and understanding. In him the philosopher is always proof against the enchantment of the poet. Like Ulysses, he hears the song of the Siren without being captivated. His genius is rather strong than universal, ideal than general; he did not have that power of assimilating to himself the sentiments and passions of men in the different phases of life. His sentiments were peculiarly his own; he first experienced, then related; he first felt within, before he said without, in tangible form, the wonders presented to our view.

Before him was ever the thought of an ideal perfection; his life and thoughts were not confined to the present nor his hopes to the actual, but reached forward and upward to embrace the mystic future, and in that future was ever a vision of some greater deed, some more worthy achievement, as an incentive to action, and a spur to the performance of higher and nobler things. He was more *in* the world than *of* it, for to him every material object is an emblematic voice, a window of spirit, a feature of divinity. Hence his thoughts are not those of ordinary mortals, but such as he alone was capable of thinking. What depths of defiant despair does he ascribe to the fallen Satan in his address to the Sun:—

> "Be then his love accursed, since love or hate,
> To me alike, it deals eternal woe.
> Nay, cursed be thou; since against his thy will
> Chose freely what it now so justly rues.
> Me miserable! which way shall I fly
> Infinite wrath, and infinite despair?
> Which way I fly is hell; myself am hell;
> And in the lowest deep a lower deep
> Still threatening to devour me opens wide;
> To which the hell I suffer seems a heaven."

The seventeenth century, the time in which Milton lived, is one peculiarly important in the annals of English history. The age of Spenser and of Shakespeare was about to give way to one more decidedly practical, and Milton, standing upon the very threshold, the heir to the past and precursor of the coming period, seemed to combine in his person the excellences of both.

With all the love of the cavalier for the beautiful in literature and art, he possessed, in an eminent degree, the stern, practical common sense and hatred of oppression which characterized the followers of Oliver Cromwell.

After a distinguished collegiate career at Cambridge, he returned to his father's home at Horton, and spent five years in preparation for the great work which lay before him. Here was conceived that grand idea which filled his whole future life; here took possession of his soul that mighty inspiration commanding him to become an author and hand down to succeeding ages an immortal work. In preparation for this he set out to travel on the Continent, but found his reputation had preceded him, and he was welcomed by the first literary characters of Europe, whose attention had been drawn to the brilliant productions of the learned and talented young Englishman. But while in Italy he heard the muttering thunders of a war-cloud advancing over his own loved land, and, obedient to the call of duty, gave up his cherished scheme and returned from travel in the prime of life and manly vigor, laden with literary distinctions, and glowing with patriotic ambition.

And what a sacrifice is here! At his country's call he gave up everything held dear to the poet's soul. Scenes dearly loved and well fitted to inspire in his breast strains to rival those of the ancient bards were left unvisited; he renounced the heavenly spectacle of the Ægean and its sunny groups of islands, renounced the sight of Attica, the cradle of the muses, the sacred hill, the pyramids and the hundred-gated Thebes—all these objects of commanding interest to the poet and the scholar, he freely surrendered to his sense of duty. His cherished schemes for the future, too, and all the passions dear to the poet's soul, were sacrificed, and for aught he knew, sacrificed forever. Like Prospero leaving the enchanted isle, he turned his back on the world of fancy and song, gave up his cherished schemes of travel and of study—those bright visions of the future dearer to him than life itself—and offered them, a willing sacrifice, on the altars of patriotism.

Although such matchless gems as "L'Allegro," "Il Penseroso," and "Lycidas"—that beautiful and pensive elegy on the death of the friend and companion of his college life—can never lose their claim, yet it is upon "Paradise Lost" that Milton's fame as a poet chiefly rests; his other works would of themselves have made his name immortal, but placed by the side of the mighty epic, they dwindle into comparative insignificance. In this poem his genius takes its highest flights, shines with its brightest lustre, making it the noblest epic the world has ever seen.

The rarest flower in the intellect of man, and that best fitted to give grandeur and majesty to poetry, is the power of the sublime, and in Milton only, first and last, does this agency blaze and glow with an undiminished splendor. Other epic poets, as Homer and Dante, break out in vivid flashes here and there, but they are not sustained, and, compared with Milton, are as blazing meteors to a fixed and steady star. The former may attract our attention more for the moment, but how much more commanding and worthy of admiration is the latter.

An eminent French critic has called Milton the "Homer of Christianity," and in many respects they are similar; both in their latter years had the windows of heaven closed to their mortal sense, and Milton, for this and other reasons, seems to have considered the Mæonian bard as his prototype and striven to equal him in his flights of song. Both are strong, majestic and imposing, but Milton treats of principles, Homer of individuals; one is subjective and synthetic, the other, objective and analytic; the English Puritan forgets the outward in his intense concentration on the emotions of his own soul; the Grecian sage rises in inspiring strains, conscious of the admiring gaze of the world. In the choice and treatment of his subject, too, Milton rises infinitely beyond his distinguished predecessor. The father of epic verse treats of the exploits and adventures of ancient heroes, men great and noble, it is true, but still only *men;* Milton sings of deities and spirits, and the counsels of high Heaven. Gods were his characters, divinities were his

people, and by the magic of his master mind, moulded all into a work of perfect symmetry and majestic beauty. His imagination formed new worlds, embodied new modes of existence with new and superior beings, accompanied the choirs of heaven, and traced the blackest counsels of the deepest hell.

In all this, too, Milton is especially a Christian poet, and his avowed intention is to "vindicate the ways of God to man" and show the necessity of obedience to the Divine law. He caught the truths that fell from the lips of the "wandering Galilean" nineteen centuries ago, and, touched with the live coal of inspiration, uttered in song as it were the very oracles of God. He spoke as a seer would speak to whom his message was a burden and to whom it was a necessity that his words should be words of fire.

This sublime epic is not appreciated by all, for the simple reason that what is ideally grand lies beyond the reach of ordinary human sympathy. But time will do him justice, for regularly as coming generations unfold their vast processions, regularly as those processions move forward at the impulse of a nobler music, regularly as the dormant powers and sensibilities of man are more and more developed, "Paradise Lost" will be called for more and more, and less will the immortal epic have to complain of chilling neglect at the hands of a people whose language has been enriched and nation honored by the production of this poetical masterpiece. Written in age and poverty, with mortal eyes closed to the objects of this our earth, he seems with eyes of spirit to have caught a glimpse of the world beyond.

With the horror of a great darkness upon him, he had to struggle with straitened means and failing health, but the brave spirit bore nobly up, exposed to the heartless jeers of a profligate court. One may almost see him standing pale and tremulous before a few faithful friends, his sightless eyeballs turned towards the vault of heaven—but turned also in vain —as he utters the sad and heartsick words, "No light of sun or moon or star throughout the year." But his lofty soul triumphs

over despair and neglect, and from out the very shadow of the sepulchre spake the "old man eloquent" with an unwonted tenderness and power, for the tenderness was of the nearing grave and the power was of the world unseen :—

> "I have naught to fear.
> This darkness is the shadow of Thy wing ;
> Beneath it I am almost sacred ; here
> Can come no evil thing."

The whole life of Milton was one long self-sacrifice at the altar of his country. His fortune, his friends, all hopes of preferment, the pleasures and plans of early youth, that grand scheme which animated his very being, the God-given sense of vision itself, he surrendered, freely surrendered for the sake of truth, and justice, and liberty.

Had he possessed that convenient pliancy of principle which characterizes so many of the politicians of our day, he might easily, like them, have attained to emolument and pride of power. But his lofty spirit spurned all such contemptible motives, and true to itself and its sense of right, marched ever onward, a beacon light, leading to the sacred shrine of patriotism.

As a statesman he must necessarily have been a failure: his ideas were too visionary, his plans too ideal, to be put into practical use; but his self-sacrificing love of liberty, his devotion to the interests of his country and his fellow-men, must ever be held above reproach, on whose escutcheons there is not visible the shadow of a stain. This shall not be forgotten, and in every British heart, in every British home, shall kindle that Promethean fire, the sublime flame of patriotism, honor and love, commended by his words and consecrated by his example.

His opinions may in some cases have been ill-formed, some of his actions may have been unwise, but his intentions were pure and his motives honorable in every instance. His lot was cast in troublous times, when fierce and strange thoughts were seething through the minds of men.

Milton allied himself with the party which he considered

right, and, though not in unison at every point, fought their battles and defended their cause till the bitter end, when their hopes were overthrown and their cause to all appearance lost.

But Milton saw deeper than they: he with them fought to release man from the thraldom of man, but his perceptions were keener than theirs, and his thoughts such as they never dreamed of. He struggled for the emancipation of human thought, for the freedom of human speech and action, and his words, a clarion cry ringing through the sounding grooves of time, have found a responsive echo in many a human heart and struck the fetters from the limbs of nations. Such deeds as his, such sentiments as these, can never die. Standing in Westminster Abbey, the silent resting place of the great and good, before the beautiful tomb erected to his memory, we cannot conceive of Milton as in that narrow clod; his spirit is alive and breathing, and animates the hearts of millions. That which made Milton and men like him, can never die. The hand that traced the glowing words of the "Areopagitica" is indeed motionless; the eloquent lips that sustained it are hushed; but the lofty spirit that conceived and maintained its principles moves still resplendent over the field of honor, the rose of heaven in its cheek, the fire of liberty in its eye.

To be cold and breathless, to feel and speak not, this is not the end of existence to men who have breathed their spirits into the institutions of their country, who have stamped their characters on the pillars of the age, who have poured their hearts' best blood and the noblest efforts of their lives on the altars of their native land. Such men as these Britain and Britons, wherever found, shall ever delight to honor and cherish. Britain takes pride in her military prowess, she rejoices in her natural position, she is grateful for her material prosperity, but richer than the merchandise in her palatial warehouses, lovelier and more enchanting than her encircling panoramas of lake and stream, sea and islet, garden and grove, is the sacred memory of her sons, noble and true—these are her jewels, these her abiding treasures.

DER ZEITGEIST; OR, THE SPIRIT OF THE TIMES.

BY A. E. LANG.

FORTY years ago there might have been seen in England one of those unexpected phases of mental agitation which at the time seem to have no apparent cause, and are only properly understood by the lurid light which the future present casts upon them. The "Tracts for the Times" roused all England to such a pitch of excitement as we, who have now learned to discriminate so clearly between the true and the false in all those subtle questions which vex that age, can but faintly realize. That brilliant meteor when it struck the moral atmosphere of England reached a white heat and is long ago a burnt-out cinder. When we look at the intense earnestness of those men who took part in that famous controversy, when we realize how universally the English mind was stirred, and when we consider that the questions were of vital interest to all men, we begin to realize how fast we have travelled in these forty years, and how far we have left behind us the old traditionary landmarks. How did we emerge so suddenly from the darkness of chaotic night to the brilliance of midday? Did some master-spirit arise and illuminate the dark and intricate windings of the maze with a torch of reason so clear that all who were lost therein were lost no longer, that even the most stubborn skeptic was convinced. No, the true explanation must be sought for in the mental constitution of the people, in the combined life of the nation. A great reform wave swept over England just as a moral wave sometimes does to-day. It was remarkable how pious Germany became during the outbreak and course of the Franco-German war of 1870-71. It terminated, unfortunately, with the surrender of Napoleon at Sedan. The social purity movement a year ago succeeded admirably in carrying the filth of all England to where its stench could most conveniently penetrate every nostril. Crazes have their day, but the serious forces of the world go on undis-

turbed. As for the "Tracts" themselves, they would have fallen flat had they appeared in almost any other age. To-day they would have been scarcely read. The spirit of reform which made them possible struck Parliament, prisons, schools, the Church, and everything else. These periodic storms, often so ruinous in their immediate results, generally have the effect of purifying the social atmosphere. Nothing impresses us more strongly than the idea of change. The violets which fill a whole meadow with their fragrance to-day, to-morrow have disappeared. But they have not ceased to be, they have only changed. So in the realm of mental vision there is constant change. Ideas that we thought we had fathomed years ago, come back to us with a force little dreamed of. How clearly we see our mistakes after we have come to acknowledge them. And is it not strange that we so seldom do acknowledge them immediately? No, we must first divest ourselves of all personal dependence and view them in historical perspective. We are too susceptible of passion and prejudice to be able to pass judgment at once. Is it strange that nations should be similarly constituted? And change there is here, too, sometimes for better, often for worse. He who can best gauge the direction of the national current of thought will be most successful with his contemporaries. Bacon is the best example I know of. He is a genuine production of his age. Dante, Milton, and even Shakespeare, in a measure, were in advance of their times.

In the life of nations there are periods which shine out with peculiar lustre; others, again, when we look in vain for anything higher than mediocrity. Nations are sometimes powerfully affected by mighty impulses for good or evil. Whence these impulses? Are they from within or from without? The spirit of to-day would answer, "From without." But is the spirit of to-day infallible? Is it safe to measure truth by the shrunken faith of the existing generation? Let us reflect that truth must be measured by eternal laws, and that faith must be measured by truth.

When you are told that "coal is the cause of England's

greatness," you have a better index of the tendency of our times than any I could give. You may accept that view if you like, but you must be prepared to apply the logic by which you do so. Accept that view and the essence of our poetry is lost, and one-half our philosophy becomes meaningless to you, except in so far as it shows the folly of the writer. But even in this age of universal and contagious matter-worship, there are some who presume to hold that the Shakespeares, the Miltons, and the Tennysons constitute the chief glory of England, and we are quite willing to forego some of the luxuries of coal rather than forego the luxury of "Hamlet," "Paradise Lost," and "In Memoriam."

The spirit of to-day, it seems to me, is one of painful unrest. Everywhere—in the moral, in the intellectual, in the social world—there is a strange vacillation; a wavering of thought; an oscillation of ideals. We have come to clearer conceptions in things that touch our individual selves, and we are more than ever oppressed by the mystery pervading all things. Clearer than ever rings out to us the trumpet-call to arms. Vaguer and more vague appears the image of the trumpeter and the why and wherefore of the revéille.

This uncertainty acknowledges for its cause our now almost completed transition from the worship of the spiritual to the worship of the material universe. This transition is not the work of a day but of a century. It has grown upon us till we can calmly talk of our ancestors as fools. We judge of the intellectual power of former days by the progress they had made in the mechanical arts, or rather we judge of *our* intellectual superiority by the enormous advance we have made in this direction. And nowhere is this tendency more clearly observable than in our own "great, crude, avaricious America." America more than anywhere else because of its youth, its wealth, its resources, its Democratic tendencies. The relations between Democracy and culture are not yet harmoniously adjusted, and many a weary day must elapse before the completion of that happy event greets our eyes. In the meanwhile

there is anger, and discord, and strife. Listen for a moment to the warring voices that mingle with deafening roar over present issues. Think of a state of society in which are possible questions such as "Labour *vs.* Capital," and "The Divine right of majorities," and then ask yourselves if the boasted light of the nineteenth century is not an *ignis fatuus* that has but led us further from the truth. A few short years ago we laughed at the idea of Nihilism gaining a footing on American soil. To-day Socialism—a twin-brother fed and nourished by misguided sympathy and unblushing selfishness—is growing daily in power for evil. The recent vote polled by Henry George in New York was an index of the current of events that astonished the world.

In this age, such is our confidence in the efficiency of work that it is beginning to be recognized as the only necessary factor in order to produce excellence. The dullest student is told that if he "applies himself" he will surely succeed. Every boy in the United States is told that the White House may be his if he will but work "steadily." Our books for young men are filled with such ideas. As our views of work are thus exaggerated, our respect for mechanism, by which work is done, necessarily increases. To-day it has become worship. I cannot forbear quoting a writer who has kept his soul pure, and whose spiritual vision has been undimmed by the fog of materialism about him. He says:—"Almost the whole system and hope of modern life are founded on the notion that you may substitute mechanism for skill, photograph for picture, cast-iron for sculpture. That is your main nineteenth century faith, or infidelity. You think you can get everything by grinding—music, literature and painting. You will find it grievously not so; you can get nothing but dust by mere grinding."

Side by side with this worship of mechanism goes on the depreciation of ideal things. In former days men believed that spirit was the vivid reality, matter the symbol. To-day we are so scornfully sure that they were wrong, that "matter" is the living reality, and that "spirit" is the manifestation of energy, and that the highest emotions of the soul depend on molecular

arrangement. Transcendental Idealism is a sweet delusion of the past, as far as the great mass of thinking humanity is concerned. Emerson once said that "culture inverts the vulgar views of nature and brings the mind to call that apparent which it used to call real, and that real which it used to call visionary." But that was written almost fifty years ago, and fifty years make a difference. We are satisfied now, *owing to our advanced light*, that existences must be perceptible to the senses.

Another and peculiar element, and one of enormous influence, enters into the composition of the national Anglo-Saxon life of to-day. It is the spirit of insincerity—"the mean and shallow love of jest." It has appeared many times before, and in every clime, but never was its influence so insidious and widespread as at present: a spirit which makes itself felt in almost every branch of literature and is an effective barrier to all greatness in the present age. Nothing is taken seriously, and, while it is so, men dare not open their hearts to us and disclose their purest and best thoughts.

Many factors go to make up the spirit of the times. We have touched only on a few. Every individual member of society helps to decide the direction of the current. Just as a thousand glittering streams that flowing from the mountain side unite at its base. Now fanned by the breath of summer, now lashed by the storms of winter, ever changing, never at rest. Thus, it appears to us, may the life of nations be fitly represented. But yesterday the blue heavens were reflected on its glassy surface. To-day we are bewildered by the fog and the warring of the elements. To-morrow we fondly hope to enjoy our existence under the soul-uplifting influence of clearer skies, or perhaps the dreamy melancholy of an Indian summer's day.

We may have read wrongly the book of passing events, and our auguries for the future may be erroneous. But though society may be better or worse than we believe, we are hurrying on to the ocean of Eternity, nevertheless, and further?—we know not.

SCIENCE AND THEOLOGY.

BY JOHN BURROUGHS.

I KNOW full well that science does not make up the sum-total of life; that there are many things in this world that count for more than exact knowledge. A noble sentiment, a heroic impulse, courage, and self-sacrifice—how all your exact demonstrations pale before those things! But I recognize the fact that within its own sphere science is supreme, and its sphere is commensurate with human reason; and that, when an appeal is made to it, we must abide by the result. Theology assumes to be a science, the science of God, and as such the evidence, the proof upon which it relies, must stand the test of reason, or be capable of verification. Religion, as a sentiment, as an aspiration after the highest good, is one thing; but, formulated into a system of theology, and assuming to rest upon exact demonstration, is quite another. As such it is exposed to the terrible question, Is it true? In other words, it comes within the range of science, and must stand its fire. When miracles are brought forward as an evidence of the truth of Christianity, the natural philosopher is found to ask, Do miracles take place?

If our life were alone made up of reason or of exact knowledge, science must be our guide. But probably four-fifths of life is quite outside of the sphere of science; four-fifths of life is sentiment. The great ages of the world have been ages of sentiment; the great literatures are the embodiments of sentiment. Patriotism is a sentiment; love, benevolence, admiration, worship, are all sentiments.

Man is a creature of emotions, of attractions, and intuitions, as well as of reason and calculation. Science cannot deepen your love of country, or of home and family, or of honor and purity, or enhance your enjoyment of a great poem or work of art, or of a heroic act, or of the beauty of Nature, or quicken your religious impulses. To know is less than to love; to know the reason of things is less than to be quick to the call of duty. Unless we approach the Bible, or any of the sacred books of

antiquity, or the great poems, or Nature itself—a bird, a flower, a tree—in other than the scientific spirit, the spirit whose aim is to express all values in the terms of the reason or the understanding, we shall miss the greatest good they hold for us. We are not to approach them in a spirit hostile to science, but with a willingness to accept what science can give, but knowing full well that there is a joy in things and an insight into them which science can never give. There is probably nothing in the Sermon on the Mount that appeals to our scientific faculties, yet there are things here by reason of which the world is vastly the gainer. Indeed, nearly all the utterances of Christ rise into regions where science cannot follow. "Take no thought of the body." "He that would save his life shall lose it." "Except ye become as little children, ye cannot enter the kingdom of heaven," etc. These things are in almost flat contradiction of the precepts of science.

It may be noted that Christ turned away from or rebuked the more exact, sceptical mind that asked for a sign, that wanted proof of everything, and that His appeal was to the more simple, credulous, and enthusiastic. He chose His disciples from among this class—men of faith and emotion, not too much given to reasoning about things. In keeping with this course of action nearly all His teachings were by parables. In fact, Christ was the highest type of the mystical, parable-loving, Oriental mind, as distinguished from the exact, science-loving, Occidental mind.

Let us not make the mistake of supposing that all truth is scientific truth, or that only those things are true and valuable which are capable of verification by the reason or by experience. Truth has many phases, and reaches us through many channels. There is a phase of truth which is apprehended by what we call taste, as poetic truth, literary truth; another phase which is felt by the conscience, as moral truth; and still another, which addresses the soul as the highest spiritual and religious truths. All these are subjective truths, and may be said to be qualities of the mind, but they are just as real for all that as

the objective truths of science. These latter are the result of demonstration, but the former are a revelation in the strict sense. Such a poet as Wordsworth, such a writer as Emerson speaks to a certain order of minds. In each case there is a truth which is colored by, or rather is product of, the man's idiosyncrasy. In science we demand a perfectly colorless, transparent medium: the personality of the man must be kept out of the work; but in poetry and in general literature the personality of the man is the chief factor. The same is true of the great religious teachers: they give us themselves. They communicate to us, in a measure, their own exalted spirituality. The Pauline theology, or the theology which has been deduced from the teaching of Paul, may not be true as a proposition in Euclid is true, but the sentiments which animated Paul—his religious fervor, his heroic devotion to a worthy cause—were true, were real, and this is stimulating and helpful. Shall we make meat and drink of sacred things? Shall we value the Bible only for its literal, outward truth? Convince me that the historical part of the Bible is not true, that it is a mere tissue of myths and superstitions, that none of those things fell out as there recorded; and yet the vital, essential truth of the Bible is untouched. Its morals, its ethics, its poetry are forever true. Its cosmology may be entirely unscientific, probably is so, but its power over the human heart and soul remains. Indeed, the Bible is the great deep of the religious sentiment, the primordial ocean. All other expressions of this sentiment are shallow and tame compared with the briny deep of the Hebrew scriptures. What storms of conscience sweep over it; what upreaching, what mutterings of wrath, what tenderness and sublimity, what darkness and terror are in this book! What pearls of wisdom it holds, what gems of poetry! Verily, the Spirit of the Eternal moves upon it. Whether, then, there be a personal God or not, whether our aspirations after immortality are well founded or not, yet the Bible is such an expression of awe, and reverence, and yearning of the human soul in the presence of the facts of life and death, and of the power

and mystery of the world, as pales all other expression of these things; not a cool, calculated expression of it, but an emotional, religious expression of it. To demonstrate its divergence from science is nothing; from the religious aspirations of soul it does not diverge.

What I wish to say, therefore, is that we are conscious of emotions and promptings that are of deeper birth than the reason, that we are capable of a satisfaction in the universe quite apart from our exact knowledge of it, and that the religious sentiment of men belongs to this order of truths. This sentiment takes on various forms; the forms themselves are not true, but the sentiment is. To recur to my former illustration of the constellations—however fantastic the figures which the soul has pictured upon the fathomless dome, the stars are there; the religious impulse remains.

It is perhaps inevitable that systems should arise, that creeds should be formed, and that the name of science should be invoked in their behalf, but the wise man knows they are perishable, and that the instinct that gave them birth alone endures. What is the value of this instinct? It would be presumption for me to attempt to estimate it, or to hope to disclose its full significance. Its history is written in the various ethnic religions; often written in revolting forms and observances. But it tends more and more to purify itself, rises more and more toward the conception of the fact that the kingdom of heaven is within and not without; and this purification has, in our day, unquestionably been forwarded by what we call science.—*Popular Science Monthly.*

THAT is the most excellent state of society in which the patriotism of the citizen ennobles but does not merge the individual energy of the man.

ALL genius is metaphysical; because the ultimate end of genius is ideal, however it may be actualized by incidental and accidental circumstances.

THE POETRY OF THE LOCOMOTIVE, OF HARVESTING, ETC.

BY JOHN BURROUGHS.

THERE is a feeling in heroic poetry or in a burst of eloquence that I sometimes catch in quite different fields. I caught it this morning, for instance, when I saw the belated trains go by, and knew how they had been battling with the storm, darkness, and distance, and had triumphed. They were due at my place in the night, but did not pass till after eight o'clock in the morning. Two trains coupled together—the fast mail and the express—making an immense line of coaches, hauled by two engines. They had come from the West, were all covered with snow and ice, like soldiers with dust of battle upon them. They had massed their forces, and were now moving with augmented speed, and with a resolution that was epic and grand. Talk about the railroad dispelling the romance from the landscape! if it does, it brings the heroic element in. The moving train is a grand spectacle, especially in stormy and tempestuous nights. When I look out and see its light, steady and unflickering as the planets, and hear the roar of its advancing tread, or its sound diminishing in the distance, I am comforted and made strong of heart. O night, where is thy stay? O space, where is thy victory? Or to see the first mail pass in the morning is as good as a page of Homer. It quickens one's pulse for all day. It is the Ajax of trains. I hear its defiant, warning whistle; hear its thunder over the bridges, and its sharp, rushing ring among the rocks; and in the winter mornings see its glancing, meteoric lights; or, in the summer, its white form bursting through the silence and the shadows—its plume of smoke lying flat upon its roofs and stretching far behind—a sight better than a battle. It is something of the same feeling one has in witnessing any wild, free careering in storms and in floods in Nature; or in beholding the charge of an army, or in listening to an eloquent man, or to a hundred instruments of music in full blast—it is triumph, victory! What is eloquence but mass in motion—

a flood, a cataract, an express train, a cavalry charge? We are literally carried away, swept from our feet, and recover our senses again as best we can.

I experienced the same emotion when I saw them go by with the sunken steamer. The procession moved slowly and solemnly. It was like a funeral cortege—a long line of grim floats and barges and boxes, with their bowed and solemn derricks—the pall-bearers—and underneath, in her watery grave, where she had been for six months, the sunken steamer partially lifted and borne along. Next day the procession went back again, and the spectacle was still more eloquent. The steamer had been taken to the flats above, and raised till her walking-beam was out of water. Her keel was also exposed and cleaned and rung, and the wreckers' herculean labor seemed nearly over. But that night the winds and the storms held high carnival. It looked like pre-concerted action on the part of tide, tempest, and rain, to defeat these wreckers, for the elements all pulled together, and pulled till cables and hawser snapped like threads. Back the procession started; anchors were dragged or lost, immense new cables were quickly taken to shore and fastened to trees; but no use, trees were upturned, the cables stretched till they grew small and long like harp strings, then parted; back, back against the desperate efforts of the men, till within a few feet of her old grave, when there was a great commotion among the craft; floats were overturned, enormous chains and colossal timbers were snapped like pipe-stems, and with a sound that filled all the air, the steamer plunged to the bottom again in seventy feet of water.

I am glad to observe that all the poetry of the midsummer harvesting has not gone out with the scythe and the whetstone. The line of mowers was a pretty sight, if we did not sympathize too deeply with the human backs turned up then to the sun; and the sound of the whetstone, coming up from the meadows in the dewy morning, was pleasant music. But I find the sound of the mowing-machine and the patent reaper

are even more in tune with the voices of Nature at this season. The characteristic sounds of midsummer are sharp, whirring crescendo of the cicada or harvest-fly, and the gasping, stridulous notes of the nocturnal insects. The mowing-machine repeats and imitates these sounds. 'Tis like the hum of the locust and the shuffling of a mighty grasshopper. More than that, the grass and the grain at this season have become hard. The timothy stalk is like a file; the rye straw is glazed with flint; the grasshoppers snap sharply as they fly in front of you, the bird-songs have ceased, the ground crackles under foot, the eye of day is brassy and merciless, and in harmony with all these things is the rattle of the mower and hay tedder.

'Tis an evidence of how directly we are related to Nature, that we more or less sympathize with her weather, and take on the color of the day. Gœthe said he worked easiest on a high barometer. One is like a chimney that draws well on some days and won't draw at all on others; and the secret is mainly in the condition of the atmosphere. Anything positive and decided with the weather is a good omen. A pouring rain may be more auspicious than a sleeping sunshine. When the stove draws well the fogs and fumes will leave your mind.

I find there is great virtue in the bare ground, and have been much put out at times by those white angelic days we have in winter, such as Whittier has so well described in these lines:—

> "Around the glistening wonder bent
> The blue walls of the firmament;
> No cloud above, no earth below,
> A universe of sky and snow."

On such days my spirit gets snow-blind; and things take on the same color, or no color; my thought loses its perspective; the inner world is a blank like the outer, and all my great ideals are wrapped in the same monotonous and expressionless commonplace. The blackest of bleak days are better.

Why does snow kill the landscape and blot out our interest in it? Not merely because it is cold and the symbol of death,

for I imagine as many inches of apple blossoms would have about the same effect; but because it expresses nothing. White is a negative—a perfect blank. The eye was made for color and for the earth tints, and when these are denied it the mind is very apt to sympathize and to suffer also.

When the sap begins to mount to the trees, and the spring languor comes, does not one grow restless indoors? The sun puts out the fire, the people say; and the spring sun certainly makes one's intellectual light grow dim. Why should not a man sympathize with the seasons and the moods and phases of Nature? He is an apple upon this tree, or rather he is a babe at this breast, and what his great mother feels affects him also.

One of the strong and original strokes of Nature was when she made the loon. It is always refreshing to contemplate a nature so positive and characteristic. He is the great diver, and flies under water. The loon is the *genus loci* of the wild northern lakes, as solitary as they are. Some birds represent the majesty of Nature, like the eagles; others its ferocity, like the hawks; others its cunning, like the crows; others its sweetness and melody, like the song-birds. The loon represents its wildness and solitariness. It is cousin to the beaver. It has the feathers of a bird and the fins of an animal, and the heart of both. It is as quick and cunning as it is bold and resolute. It dives with such marvellous quickness that the shot of the gunner gets there just in time "to cut across a circle of descending tail feathers and a couple of little jets of water flung upward by the web feet of the loon." When disabled, so that it can neither dive nor fly, it is said to face its foe, look him in the face with its clear, piercing eye, and fight resolutely till death. The gunners say there is something in its wailing, piteous cry, when dying, almost human in its agony. The loon is, in the strictest sense, an aquatic fowl. It can barely walk upon land; and one species, at least, cannot take flight from the shore. But in the water its feet are more than

feet, and its wings more than wings. It plunges into this denser air, and flies with incredible speed. Its head and beak form a sharp point to its tapering neck. Its wings are far in front, and its legs equally far in the rear; and its course through the crystal depths is like the speed of an arrow. In the northern lakes it has been taken forty feet under water, upon hooks baited for the great lake trout. I had never seen one till last fall, when one appeared on the river in front of my house. I knew instantly it was a loon. Who could not tell a loon a half-mile or more away, though he had never seen one before? The river was like glass, and every movement of the bird, as it sported about, broke the surface into ripples, that revealed it far and wide. Presently a boat shot out from shore, and went dipping up the surface towards the loon. The creature at once seemed to divine the intention of the boatman, and sidled off obliquely, keeping a sharp lookout as if to make sure it was pursued. A steamer came down and passed between them; and when the way was again clear, the loon was still swimming on the surface. Presently it disappeared under the water, and the boatman pulled sharp and hard. In a few moments the bird reappeared some rods further on, as if to make an observation. Seeing it was being pursued, and no mistake, it dived quickly; and when it came up again had gone many times as far as the boat had in the same space of time. Then it dived again, and distanced its pursuer so easily that he gave over the chase and rested upon his oars. But the bird made a final plunge, and when it emerged upon the surface again it was over a mile away. Its course must have been, and doubtless was, an actual flight under water, and half as fast as the crow flies in air.

The loon would have delighted the old poets. Its wild, demoniac laughter awakens the echoes on the solitary lakes, and its ferity and hardiness was kindred to those robust spirits.

EDITORIAL.

OUR VALEDICTORY.

THE V. P. Science Association, which has published KOSMOS for the last four years, having become an incorporated Society, independent of any connection with the University, has decided to publish it no longer, and to hand it over to the Science Society of Victoria College. This new Society has not been able, in the uncertainty which hangs over the future of our college and of its science department, to complete arrangements for carrying on this enterprise. For the present, then, KOSMOS will cease to appear.

The V. P. Science Association, and especially the editors of KOSMOS, return hearty thanks for the steadfast help and sympathy of so many of our subscribers during the good and ill report of the four years that we have been together. Our ideals have been much higher than our performance; yet we trust that there are some who have been helped by the thoughts contained in our pages. For kindly notice of our work we especially thank the *Christian Guardian* and the Toronto *World*, also the *Educational Weekly*, the *facile princeps* of educational publications in Canada. Occasional papers on important subjects, by members of the V. P. Science Association, may be expected to appear from time to time in some other form than in a regular publication. Thus we close Volume IV. of KOSMOS—wishing success to all brave attempts in Canadian journalism, to Victoria College in the future which will follow the present transition stage, and to all her sons who are ready to make our Canada stronger by adding their strength to all that is best in our young nation.

A PROMISED ARTICLE.

WE regret to state that we are not able to present to our readers the promised article from the pen of Dr. C. S. Eby, of Tokio, Japan, on "The Possible Development of Christian Ethics." We delayed the issue of this number, hoping that it would come to hand, but we have been disappointed. President Warren has kindly given us the privilege of printing his lecture, "World's Convention to Define and Promulgate a Perfect and Universal Religion." It is a production worthy of the learned author of "Paradise Found," and we are sure that those of our readers who see it for the first time will enjoy its lofty argument.

IMPERIALISM AND CANADA.

TWO varying streams of tendencies are the factors in the problem of the political destiny of Canada—one made up of those influences which make for closer union with the motherland, and the other of those which make for annexation with the United States. The one is composed mainly of traditional ties of blood and a certain Britishness of feeling, which we have not yet shaken off; the other of commercial influences, the infection of nearness, and a sympathy begotten of similar political ideals, dangers, and participation in New World aspirations. The New World life is quite distinct from that of the Old World. We are beginning to feel that America, on moral questions, is to move as a whole. The New World sympathies are ours, and a New World destiny awaits us. Brotherhood, if not marriage, with the United States is unavoidable, unless, in the future, unhappy jealousies and strifes draw a forty-ninth parallel of latitude between our hearts. On the other hand, there is a deep and sincere love for the old country, and "God save the Queen" has a strange power to move our hearts. The feeling of loyalty to the great Empire of which we form a part, and the attraction of race kinship and common Christian sentiment,

which even the people of the United States cannot resist, all tend to keep us true to our old-time allegiance. These forces have lost none of their strength even during the days of English indifference; and now we may expect to see their power redoubled, when, by the Colonial Exhibition, the meeting of the British Association for the Advancement of Science (at which the discussion of subjects relating to Canada occupied a prominent place), the completion of the Canadian Pacific Railway, the sudden awaking of the British mind to the importance to the Empire and to British commerce of this route to the East, and the project of an Australian cable, which, branching to India, will bind the whole Empire together in one telegraphic system, are causing that carelessness to give way to a kindlier interest. Should such schemes as Lord Rosebery's, of cheap postage between England and the colonies, and that of a protected free trade, become accomplished facts; should Canada, as holding in her hands the shortest and cheapest routes to Asia, become the pathway of a great trans-continental traffic,—loyal sentiment, supported by great commercial advantages, may decide the destiny of Canada to be imperial. Should the two streams of tendency be of equal force, Canadian independence may be the result. Should the friendly feeling now growing so strong between England and the United States still increase, Canada, as the commercial and political friend of both, may become the battleground of peace and the central link in the indissoluble chain of an Anglo-American alliance. A few decades hence may see national lines dissolving and disappearing as sectarian lines are now doing, and a Christian enthusiasm for humanity the fashionable sentiment. Just now it is certain that, with our geographical nearness to the United States, the bird of Imperialism will make but a sorry flight unless the winds of commercial advantage bear it onward. Let our statesmen make the bonds and the sentiment of Imperialism as strong as they may—the stronger the better; for our New World sympathies must grow, and an Anglo-American alliance, if ever formed, will be the more inseverable and powerful—a three-

fold cord which cannot be broken. When that takes place, the allied millions of Anglo-Saxondom could bully the world into universal peace.

COLLEGE MEN AND POLITICS.

ONE of the great dangers of our political life is the presence in our midst of men favored with political privileges who use them with so little sense of responsibility that thinking men are horrified. How many are there who go to the polls literally the tools of the party leaders, and the prey of the briber, the demagogue, and the courteous canvasser? How many put their consciences into other men's hands, and whose vote is exploited by the master of the most cunning phrase? All men are met by such influences; but the safety of our country and the grandeur of our politics will come from those who rise above them, and who, in a spirit of thoughtful independence, will not fear to throw into speech and act the honest convictions of their hearts. How many men come from the political stump disgusted with the insincerities and unfair partisan arguments by which they have misled the crowd and won the day! What a hunger there is in the country for men and newspapers who will discuss questions on their merits! How many are asking, "How can anyone be an honest man and a thorough-going partisan?" What can bring a freer, healthier tone to political life in Canada, now so infected? Nothing but the growth of the number of independent voters. To whom has the country a better right to look for this salvation than to the college men? It is the right and the duty of the educated classes to sit as judges upon the acts of our public men and our political parties. In them the best conscience of the nation should speak. They are the ones who shall steady the masses, by the infusion of seriousness into our political life. When a college man becomes a partisan, in the narrow sense of that word, and argues for victory rather than for the establishment of truth, he proves untrue to his high calling and utterly

unworthy of his privileges. The selling of one's judgment, tongue and pen to a party is most pernicious in its effects upon a man's moral integrity. One trained to think throws away the best half of his manhood when he is guilty of this self-stultifying crime.

During the last political campaign, upon the occasion of the visit to Cobourg of Sir John A. Macdonald and his colleagues, the Conservative students of Victoria College presented the Premier with an address, which found its way into public print. It would have been, we think, right and proper if the students, irrespective of party, had chosen to present an address to the present head of our government, the father of Canadian Confederation, and as yet our most successful statesman. When, through party prejudices, that became impossible, it was still quite right and proper that those who recognized Sir John as the leader of the party whose principles they had adopted as their own, should express their loyalty to their principles and their leader. As matters came out, the hastily-prepared document proved to be vigorous, partisan, and almost adulatory. There was no recognition of any fair-mindedness in the opposing party. Sir John A. Macdonald was told that his colleagues needed "no recommendation except his choice," and the whole address was a fine model of an eloquent party document, but it was no more. It was not pervaded with that judicial, independent tone which should dignify a document coming from a seat of learning. Hearty and enthusiastic expression of appreciation of the grand work of a statesman, who has had the interests of his country at heart, and, though having had many chances to enrich himself, will die poor, was eminently becoming, even when it went to the full bounds of eulogy; but the courteous statement of our claim, as young thinkers, to the right of judging, independently of party lines, of all the acts of any government, would have shown a realization of our duty to the State, and made our support and praise of any men or measure, things of greater value in the eyes of all who were apprised of our position. This is only one example of the

effects a vicious political atmosphere has in causing even young scholars to forget the high ideals which should illuminate their lives and form their political action.

Since the above was written, the *Mail* has come out with its startling pronunciamento of the 8th of January. The reception that editorial met with is a sign of the heart-sickness of the country at campaign falsehoods and the special pleading of partisanship, and its hunger for sincerity of speech in those who discuss its public matters. If we judge aright, Canada is approaching a great moral crisis in her history. Where will her college men be found in the struggle—bearing in advance the grander standards of the future, or filling their bellies with the husks that the swine do eat? Uttering strong convictions born of the present hour and need, or, bound by the magic of a name and party traditionalism, daring to speak only the words of a political set. Permanent political parties cannot exist where there is a large *free*-thinking element in the country, and in unnatural permanence is to be found a large part of their evil.

WOMAN SUFFRAGE.

IT seems that the idea of woman suffrage is rapidly passing out of the period of crankism and blue-stockingism into the period of sensible, sober advances in the recognition of woman's claims as a member of the body politic. Standing as she does most intimately connected with the interests of the children and the home, her voice must be heard in a State made up of homes and whose hope is in the children. The victory gained last year and again this year in Toronto by right principles as represented by Mayor Howland, is a testimony to the sober earnestness with which the women of the country are awaking to a sense of their political privileges and the wise way in which they are inclined to use them. The appointment by Mayor Grace of New York of women of the intelligent and sensible motherly type on the School Board of that city, is an evidence of the coming triumph of the true

woman—a triumph which could never come to such exaggerated specimens of womanhood as Mary Walker and other masculinized extremists. The magnificent earnestness, eloquence, good sense and good order shown by the Women's Christian Temperance Union Convention, recently held in Minneapolis, are proofs of woman's fitness both by a capacity for moral enthusiasm and by executive ability to urge with success great social and moral reforms. It is well said that woman's power has come into politics and has come to stay. The nation will be ruled and cared for as the home is, by the united wisdom of the man and the woman.

BOOK NOTICES.

"THE UNSEEN UNIVERSE, AND THE PHILOSOPHY OF THE PURE SCIENCES." By Prof. William Kingdon Clifford, F.R.S. Price 15 cents. J. Fitzgerald, publisher, 108 Chambers street, New York. Prof. Clifford's writings rank among the profoundest scientific and philosophical treatises of the present generation, and no thoughtful student of the progress of science can afford to pass them by unread. Both of the essays contained in this volume are characteristic of his singularly lucid style; but the second one, that on "The Philosophy of the Pure Sciences," is justly esteemed his masterpiece.

"STUDIES OF ANIMATED NATURE." J. Fitzgerald, publisher, 108 Chambers street, New York. Price, post-free, 15 cents. Here are four delightful essays on natural history subjects. First there is an essay on "Bats," by W. S. Dallas, and then one on "Dragon-Flies," by the same author. The other two essays are "The Glow-Worm," by G. G. Chisholm, B.Sc., and "Minute Organisms," by F. P. Balkwill. Natural history possesses an irresistible charm for all readers, especially when, as is the case with the present book, its beauties and wonders are unveiled by a keen-sighted observer, and are presented in the

simple, limpid style that nearly always comes unsought to the student of nature. The book is published as one of the "Humboldt Library" series, a collection of popular scientific works embracing many of the most celebrated treatises of the day upon natural science.

SCIENCE NOTES.

THE diameter of a molecule of air is .0,000,000,156, and a cubic inch of air contains 356 trillions of them.—*Puley.*

IT is stated *(Lancet)* that Mr. Cresswell Hewett has succeeded in the manufacture of quinine by synthesis, and that its cost will be about five cents an ounce. This will interest not only patients and physicians, but chemists and pharmacists.

TEA AND DELIRIUM TREMENS.—The *Lancet* records the case of a young girl who had attacks exactly resembling delirium tremens, as the result of chewing tea-leaves. Here is a warning for tea-drinkers, especially for those who use tea excessively.

OSCAR LOEW has succeeded in making the synthesis of a sugar. By treatment of a solution of form-aldehyde with lime-water, a molecular condensation gradually takes place and a sweet substance having the properties of sugar is formed. It is called formose, and its formula is $C_6H_{12}O_6$.

ISOLATION OF FLUOR.—A young chemist, M. Moissan, has succeeded in isolating from hydrofluoric acid a new substance which he believed to be fluor. M. Moissan's method consisted in submitting hydrofluoric acid to the action of a very strong electrical current and intense cold (from 23° to 51°C). After two or three hours a gas is obtained which can only be fluor.

PHOTOGRAPHING PROJECTILES.—German photographers have succeeded in photographing a projectile in the course of its flight, and some of the photographs showed "the head" of air-

condensed in front of every shot. It is said to be this head which prevents even skilled riflemen from hitting an empty eggshell when hung by a long thread. The air blows the shell away from the bullet.

INSULITE.—Dr. John Fleming has discovered a new insulator, which has been pronounced satisfactory by several electricians, including Sir Wm. Thompson. Insulite is prepared by a secret process from wood saw-dust, cotton waste, water pulp and other fibrous materials. It is impervious alike to damp and acids. It can be molded to any form and so for coating wires, making battery jars, telegraph insulators, or frames for electrical apparatus, it can well supply the places of rubber, glass, gutta percha and ebonite, without their imperfections.

THE NEW MICROSCOPE.—The new microscopic glass, invented by Drs. Abbey and Scott, is said to enable us to see objects 400 times smaller than the smallest discernible by the common lenses. The one five hundred thousandth part of an inch was the limit for the old glass, but the one two hundred and four million seven hundred thousandth part of an inch is the limit of discernment when the new glass is used. Phosphorus and barium are the most essential of the fourteen elements contained in the new glass.

DR. THOMAS DWIGHT, professor of anatomy at Harvard, is evidently opposed to the orthodox evolution of to-day. In the concluding section of a recent article from his pen we find the following :—"It is customary now to quote rudimentary organs and anatomical anomalies as evidences of descent; but it seems to me very improperly, occurring, as many of them do, quite out of the line of inheritance." "Clearly the crude notion that accidental, purposeless, experimental forces should be sufficient to change by slow degrees one such organism into another of a different species, is untenable. The doctrine of chances alone shows it to be impossible. There is, moreover, the unanswerable argument of the inevitable uselessness of

incipient structures. Where we see the need we see the structure to meet it already perfect. We see also the combination of homology with teleology." "The change must be, for the most part, comparatively sudden, and therefore due to an implanted, internal force acting in pre-determined directions. On the theory of external accidental forces, the preservation of homology is incomprehensible."

THERE is more in a heap of coal than most persons are aware of. Besides gas, a ton of gas coal will yield 1,500 lbs. of coke, 20 gallons of ammonia water, and 140 lbs. of coal tar. Destructive distillation of coal tar gives 69.6 lbs. of pitch, 17 lbs. creosote, 14 lbs. of heavy oils, 9.5 lbs. of naphtha yellow, 6.3 lbs. of naphthaline, 4.75 lbs. of napthol, 2.25 lbs. of alizarin, 2.4 lbs. of solvent naphtha, 1.5 lb. of phenol, 1.2 lb. of aurine, 1.1 lb. of aniline, 0.77 lb. of toludine, 0.46 lb. of anthracine, and 0.9 lb. of toluene. From the last named substance is obtained the new product known as saccharine, which is said to be 230 times as sweet as the best cane sugar.

LEFT-HANDEDNESS.—In the December number of the *Science* we find the following interesting facts concerning left-handedness. No purely left-handed race has ever been discovered, although there seems to be a difference in different tribes. Seventy per cent. of the inhabitants of the Pendjab use the left hand by preference, and the greater number of the Hottentots and Bushmen of South Africa do the same. Dr. Marro, as a result of his study of criminals, has found that from fourteen to twenty-two per cent. of those who have been convicted of crime were left-handed, while the highest ratio among people of all classes was only nine per cent.

A NEW SUGAR.—A new sweetening agent called saccharine, discovered about 1878, may before long considerably affect the sugar industry. It is made from coal-tar, the source of so many chemical wonders. One part of saccharine imparts a distinctly sweet taste to one thousand parts of water. It is

two hundred and thirty times sweeter than cane-sugar. Experiments in giving it to animals show that it has no deleterious effects upon the system. Unlike sugar it acts as a preventive against fermentation, which fact alone is an important point in its favor. Though its price is yet high the sweetening power is so great that it is even now in reality cheaper than sugar.

THE SODA LOCOMOTIVE.—When caustic soda is exposed to the action of steam, intense heat is the result. In this new locomotive this fact is made use of in the production of steam. At the starting point the boiler is heated by superheated steam, and by allowing the exhaust steam to play upon the soda, the heat generated keeps the water at the required temperature. When in about six hours the soda has become saturated, it can be dried and used over again. George Kuehler, a German, is the inventor of this new departure in engineering. It is used in Berlin and other European cities, and in the St. Gothard tunnel.

PICTURES BY TELEGRAPH.—A method has been invented by W. Gemmil by which a photograph taken at one end of a line can be reproduced at the other. The picture is first projected upon a selenium shell placed in a telegraphic circuit, which, according to the degree of the intensity of the light received, acts upon the current and, through it, a number of subsidiary currents connected with an incandescent lamp shining with various degrees of intensity consonant with the strength of the current. These successive illuminations, says the *Photographic Times*, would give patches of corresponding broadness to the points of the picture thrown upon the selenium shell, and the final picture, of course, would consist of these points in various depths of shade.

A NEW INCANDESCENT LAMP.—A lamp which is a good substitute for the lime light and for the electric light in private experiments has been discovered by Dr. Regnard. It acts by the ignition of air and petroleum vapor in contact with platinum.

A Bunsen burner with its mouth closed by a netting of platinum is connected by means of a rubber tubing with a glass tube which just enters a flask half full of petroleum. A small hand bellows is connected with another tube which enters the flask and reaches nearly to the bottom of the liquid. On blowing the bellows a stream of air bubbles through the petroleum, carrying petroleum vapor to the burner, where it is ignited, making platinum net white-hot. The resulting light is very brilliant, and is suitable for lighting large halls, and for spectacular effects.

FROM *Science* we learn that Dr. W. F. Tolmie, the noted Canadian ethnologist, died at Victoria, B.C., on the 8th of December. Dr. Tolmie became medical officer of the Hudson Bay Co., at Fort Vancouver, in 1833, and afterwards chief factor. When Dr. Horatio Hale visited the west coast as ethnologist to the Wilkes expedition, he met Dr. Tolmie, who henceforth was an ethnologist. The vocabularies of a number of the tribes of the Pacific coast, prepared by him, were published in "Contributions to American Ethnology." In conjunction with Dr. G. M. Dawson, he published in 1884 an almost complete set of short vocabularies of the chief British Columbian languages, and in the works of Bancroft and others he is quoted as an authority on the history and ethnology of the North Pacific coast.

THE TWENTY-FOUR-HOUR SYSTEM.—As is well known, the twenty-four-hour system has been adopted on the Canada Pacific Railway, west of Winnipeg. Mr. Fleming writes that, "The towns and villages along the line have accepted the change with great unanimity, and not a single voice has been heard in any quarter expressing a desire to return to the old usage. So satisfactory in every way has the new system proved, that the Canadian Pacific Railway Company have decided to extend its application eastward to Ontario and the valley of the St. Lawrence. The branch and connecting lines are following the same course, and I am assured that by the end of next year the

twenty-four-hour system will be in common use by the railways from Halifax in Nova Scotia, to Vancouver on the Pacific coast." This system is in use on the C. P. R. for six months, over two thousand miles of railway. It is also used on the Manitoba and North Western Railway, upon the Idaho division of the Union Pacific Railway, where it is soon to be extended to the whole line, and throughout all the telegraph lines between Great Britain, Egypt, India, South Africa, China, Australia and New Zealand. The unification of time throughout the world is evidently near at hand.

A NEW LIGHTHOUSE LANTERN.—A new lighthouse lantern has been invented by an American, which is to serve its purpose by throwing the light against the sky. The idea was suggested to the inventor by his seeing, fifty miles away, the lights of New York reflected from the clouds. The light shines out laterally as an ordinary light, and underneath is the reflector through which the flame projects, placed horizontally to throw the illumination upon the clouds, from which it is reflected over a large area. The glass dome is built of sections into the form of a bell jar.

STUART C. CUMBERLAND.—In the *Nineteenth Century* Mr. Stuart Cumberland gives a very interesting account of his mind-reading feats. He frankly confesses that he was tempted to imagine himself possessed of supernatural powers, but soon convinced himself that it was merely muscle reading, an interpretation of unconscious movements of the subject by means of his perceptions, which had always been remarkably keen. He found that statesmen, scientists and such brain workers were the best subjects. Von Moltke was the best subject, and M. Dumas the worst. Englishmen and Germans were the best races for subjects, while uncivilized races, such as Chinamen and Indians, make poor subjects. Military men are good subjects; lawyers are dodgy and unsatisfactory; musicians cannot fix their attention upon anything but music; artists are better; clergymen are good in the drawing-room, not in public; physi-

cians are good when they have no theory concerning mind-reading. Mr. Cumberland thinks there must be some kind of physical contact in such feats. He states that he has performed some tests without direct physical contact, but he was "sufficiently near his subject to receive any impressions that he physically might convey," and that he had never seen a test successfully made without such physical connection.

THE CHARLESTON EARTHQUAKE AND HEALTH.—Dr. T. Peyre Porcher, physician to the City Hospital, writes to the *Medical News* an account of the effects produced upon the health of the inhabitants of Charleston by the earthquake shocks. In addition to the effects produced by alarm and fright, many persons were attacked with nausea and vomiting which lasted in some instances for several days. Mrs. M. was nauseated during the first shock (Aug. 31), and had repeated attacks afterward with vomiting, and nervo-electrical disturbance. Miss M. was nauseated at the first vibration. Mrs. K. suffered from giddiness, with a feeling as if the floor were trembling under her feet, and experienced instead of "sadness a tendency to laughter." There was no tingling or electrical disturbance. She was nauseated at once. Mr. S. and Mr. H. had nausea and both had colic and diarrhœa following. Mrs. G. suffers from extreme nausea after every shock. She was sound asleep after the second shock (Friday, 28th September), yet awoke nauseated. "Many persons testified to feeling delicate and almost imperceptible vibrations of the earth." Mr. F. informs me that he could anticipate the recurrence of shocks by his sensations, nervousness, tingling, etc. A great many testified to experiencing the tingling—like "pins and needles"—affecting the lower extremities. Those affected could generally anticipate the approach of a shock by the peculiar nervous electrical sensations. "One gentleman has been completely cured of his rheumatism; another who for months was nervous, depressed, and entirely unable to attend to business, has regained his former activity and energy through the influences generated by the repeated

convulsions of nature." The reports of other physicians to the State Board of Health enumerated the same effects as those mentioned in Dr. Porcher's.

NERVE SETS AND COLORS.—The Young-Helmholtz theory of color sensation may be briefly stated thus: The retina contains three sets of nerve-elements, each set of which is capable of responding to but one of the three colors—red, green and violet. These are the primary colors, and our perception of other shades is due to the simultaneous excitation, to greater or less degrees of intensity, of the different nerve sets. Herr Frithiof Holmgren has been experimenting upon the eye, and the results are in entire accord with the theory. Red, green and indigo-violet were unchanged. Yellow appeared red, green or colorless as it fell upon different sets. Blue became green and violet. A yellow ray never appears yellow unless it falls simultaneously upon at least two sets; while a red, green or violet ray may be perfectly perceived, even when it does not cover one set. These results call to mind the discovery announced last year in this Journal, that in the surface of the body there are three sets of nerves, one which responds to impressions of touch, another to impressions of cold, and another to impressions of heat. Are the nerve sets in the eye finer forms of those in the body? Do those nerve sets which respond to heat become in the eye those which respond to red, the color of the heat end of the spectrum, and those which respond to cold in the skin, those which respond to violet—the heatless color—in the eye? Is there an analogy between the sensation of touch and that of a green color?

IMITATION OF MAGNETIC AND ELECTRIC CURRENTS.—Prof. Bjerknes, of Christiania, has found out that little drums made to vibrate by means of air pulses sent into them, will attract or repel each other according as they vibrate in like or unlike phase. When the diaphragms approached each other, or receded from each other simultaneously, they were attracted, and when they chased each other to and fro, they were repelled.

Mr. Augustus Stroh repeated these experiments in air, and found that his sensitive drums, set into vibration by air waves from a sounding reed and bellows, followed the law of magnets and would not only attract or repel each other, but each drum would attract bodies which were not themselves vibrating, such as pieces of paper, just as magnets will attract unmagnetized iron, etc. It has been demonstrated that the movements of the air between and around the drums is exactly similar to the lines of magnetic force around magnets. Mr. Stroh has shown that when the drums are vibrating in like phase, and therefore attracting each other, the air is rarefied between them, and when vibrating in unlike phase the air is condensed between them. Before the London Physical Society further experiments were carried on by Prof. Bjerknes, who succeeded in imitating the attraction and repulsion of electric currents flowing in paralleled wires. Two cylinders were placed parallel in water and rotated. When both rotated with right-handed motion, they attracted each other, and when one was reversed they repelled each other. These results correspond with the effects produced by electric currents flowing in the same and in opposite directions.

SELECTED NOTES.

THE trick of all thought is symbolism.

HELMHOLTZ says that "matter and force are abstractions from the real."

THE TIDES of the divine life in man move under the thickest ice of theory.—*George Eliot.*

WHO has not a thousand times seen snow fall on water? Who has not watched it with a new feeling from the time that he has read Burns' comparison of sensual pleasure—

> "To snow that falls upon a river,
> A moment white—then gone forever."

"No ordinance of man can e'er surpass
The settled laws of Nature and of God.
Not written these in pages of a book,
Nor were they passed to-day or yesterday.
We know not whence they are; but this we know,
That they from all eternity have been,
And shall to all eternity endure."

Ruskin's Mode of Composing.—Mr. Ruskin in his autobiography thus describes his own method of literary working: "My literary work was always done as quietly and methodically as a piece of tapestry. I knew exactly what I had got to say, put the words firmly in their places like so many stitches, hemmed the edges of chapters round with what seemed to me graceful flourishes, touched them finally with my cunningest points of color, and read the work to papa and mamma at breakfast next morning, as a girl shows her sampler."

"Prehistoric Man in Manitoba" is the title of a paper contributed to the British Association by Mr. C. N. Bell, F.R.G.S., of Winnipeg, Manitoba. The author announced the existence in the North-West of sepulchral mounds containing human remains, though the latter were much decayed. In the mounds were found implements of shell, bone, and stone, as well as pottery, which latter was unknown to our North-West Indians when white emigrants first arrived. The Indians when first met with buried weapons with their dead, but none were found in these burial places. These mounds, extending from Lake Winnipeg to the Gulf of Mexico, were of the same character and were probably made by one race, though the whites found great diversity of mortuary customs prevailing among the Indians inhabiting that great tract of country.

An Imperial Family.—In the Claudian-Julian family, beginning with Julius Cæsar himself, and ending with Nero, we have an almost unbroken line of neuroses. Cæsar himself was epileptic; but probably the disease developed late in life from

exposure and excesses, and did not much affect his health. Augustus, his grand-nephew, had, it is believed, writer's cramp. Julia, his daughter, seems to have been little more than a nymphomaniac; she had an imbecile son. Tiberius was a man naturally heartless, cruel, and licentious; in his later years he seems to have lost all moral sense, and illustrated the most shameless insensibility and cruelty. Caligula, reputed great-grandson of Augustus, was epileptic as a boy, badly formed and weak-minded as a man. He stuttered, was insomnious, and apparently had hallucinations. Claudius was also weak-minded, timid and credulous, with unsteady gait, weak knees, shaking head and dribbling lips.—*New York Medical Record.*

THE COMING METAL.—It is predicted that aluminum is the coming metal which is destined to supersede iron. It is the most abundant metal in the earth's crust, and is not exceeded in usefulness. It is the metallic base of mica, feldspar, slate, and clay. It is present in gems, colored blue in the sapphire, green in the emerald, yellow in the topaz, red in the ruby, brown in the emery, and so on to the white, gray, blue, and black of the slates and clays. It has never been found in a pure state, but is known to exist in combination in nearly two hundred different metals. Corundum and pure emery are very rich in aluminum, which constitutes about fifty-four per cent. of their substance. The metal is white, and next to silver in lustre; it is as light as chalk, or only one-third the weight of iron, or one-fourth that of silver; is as malleable as gold, as tenacious as iron, and harder than steel. It is soft when ductility, fibrous when tenacity, and crystalline when hardness is required. It melts at 1,300 Fahr., or at least 600° below the melting point of iron, and it neither oxidizes in the air, nor tarnishes in contact with gases.—*Popular Scientific Monthly.*

DR. STUCKENBERG, speaking of the work that philosophy is doing in Germany in aiding Christianity, said, "In its conflicts with materialistic atheism the Church is aided by philosophers. Not that the philosophers are all pronounced theists or friendly

to religion; but they direct attention to the ultimate problems of the human mind, and make earnest efforts to solve them. They expose the absurdity of the claims of materialism and distinguish sharply between physiology and psychology. Thus Wundt, of Leipzig, who has made a specialty of physiological psychology, and has done more than any other German scholar of our day to develop psycho-physics, insists that mental phenomena cannot be explained by motion in the nerves, and that psychology must begin with what is known to be mental and not with physiological facts, which may either be the occasion of mental acts, or be parallel with them. The philosophers also emphasize ethics and seek its ultimate basis. Their studies, their appreciation of the humanities, and the total tendency of their minds, are against the predominance of mechanical law. They make strenuous efforts to conserve the ideals which an exclusive naturalism destroys and buries.

GREATEST TOBOGGAN TRACK IN THE WORLD.—Tobogganing is now the great winter sport in many cities east and north. And while Toronto, Buffalo, and St. Paul are each claiming the longest runs, we desire to say that Steamboat Springs has the longest and grandest toboggan track in America. The run is 2,800 feet in length, with two plunges, one of two feet in six and 500 feet long, and one of four feet in six and 500 feet long. This wonderful chute begins at the top of Lookout Mountain, and near the United States Geological Station No. 15, and follows the slight trough or depression west of the willows and "Tobe's Hill," and makes the final plunge down the steep hill north of the pagoda, ending at the river bank, just below the mouth of Soda Creek. The elegant nine-foot toboggan belonging to Logan Crawford, bearing its owner and Professor Baker, of the Steamboat Schools, was put on this new route for a trial trip yesterday, and it was perhaps the longest and most exciting toboggan ride ever made in all the history of this famous sport. It was only on the easiest grades that the red jerseys of the wild riders could be distinguished—on the plunges and on

most of the course there could only be seen a rushing, dashing object, enveloped by the light, new snow that had just fallen. The speed that was made down the last plunge can scarcely be imagined, and as the toboggan passed on to the plain it was fairly leaping into the air. With a little improvement this new track will be all that can be desired, and can justly be claimed as the grandest in all the country.—*Pilot, Colorado.*

MARL.

C. C. JAMES, M.A., PROFESSOR OF CHEMISTRY AT THE ONTARIO AGRICULTURAL COLLEGE.

MARL is plentiful in Ontario, but from inquiries lately made as to its nature and value, a few facts concerning it may be of interest.

It is frequently found below deposits of muck or humus, in swamps and low lands, sometimes quite near to the surface. It is then of a slate or bluish white color, wet and spongy, darkened a little on top from the overlying dark soil. Upon exposure to the air it dries to a white crumbly mass, light in weight, and showing its origin in the shells of various sizes with which it is filled. Of such a nature is No. 4 of the table given herewith, which was dug up on the Experimental Farm, Guelph.

In some localities the marl bed is found exposed, high and dry, ready for immediate application to land. When found lying low and soaked with water, it should be dug out and exposed to the weather. The fall is the best time for excavating. Let it lie in heaps; in the spring it will be found thoroughly pulverized by the winter's frost.

To distinguish marl from clay, pour upon it a small quantity of any acid, and if it be marl it will effervesce. To test its value quickly, place a small lump in an earthen dish and pour upon it a little hydrochloric acid; the less residue undissolved the better the sample of marl. The effervescence is caused by the setting free of carbonic acid gas from the carbonate of lime,

of which marl is principally composed. The carbonate of lime or calcium is the most valuable ingredient. In addition will be found small quantities of sand, silica, oxides of iron and aluminum, and occasionally small quantities of phosphate of lime. Marl, however, is a lime fertilizer, and is used as such.

The results of analyses are given in the following table, in which some of the percentages are wanting, though the important ones are given. The first seven were analyzed lately at the laboratory of the Ontario Agricultural College by myself. Nos. 1, 2 and 3 came from north-eastern Ontario; No. 4 from the Experimental Farm, direct from a low-lying bed; No. 5 is a weathered sample, locality unknown; No. 6 is from near Toronto; No. 7 is from Quebec; No. 8 is an Ontario marl, analyzed by the Connecticut Station; Nos. 9, 10, 11 and 12 are Michigan marls, analyzed at Lansing College; Nos. 13 and 14 are from North Carolina:—

No.	Water.	Sand and Silica—insoluble matter.	Oxide of Iron and Aluminum.	Magnesium Carbonate.	Lime or Calcium Carbonate.	No.	Water.	Sand and Silica—insoluble matter.	Oxide of Iron and Aluminum.	Magnesium Carbonate.	Lime or Calcium Carbonate.
1	2.82	1.13	1.84	1.29	92.92	8	2.51	0.41	0.29	2.10	94.69
2	11.10	2.48	1.37	1.27	83.78	9	1.43	13.00	1.43	4.54	79.60
3	20.64	1.09	0.92	0.98	76.37	10	.....	36.79	1.05	6.00	56.16
4	53.90	1.42	0.52	1.18	42.98	11	.....	5.50	.....	2.00	90.00
5	2 25	5.51	1.16	1.84	89.24	12	.....	16.00	.....	2.50	80.00
6	1.56	1.54	1.89	0.72	94.29	13	.....	74.86	.....	.....	10.57
7	2.41	0.83	0.76	96.00		14	.....	0.48	.....	.....	94.00

According as the lime, clay or sand predominates, the marl is classed as calcareous, clayey or sandy. The Ontario samples are calcareous; the 13th is a sandy marl.

As before noticed, marl is a lime fertilizer. Phosphoric acid, when present, adds to its value slightly. Its effects are either physical or chemical. Physically, it seems to give lightness and looseness to soils, and thus render them more workable. Chemi-

cally, it serves either as a direct food to the plant, in the case of grasses, or indirectly, by its action in rendering available the organic compounds in decaying vegetation—humus, for instance.

The nitrogen of swamp muck is unavailable in its usual condition. Thoroughly drain the land and apply 60 to 75 bushels of marl per acre. On light soils apply about 25 bushels per acre, sufficient to help the decomposition of organic matter and supply lime to the crops. For grasses, add about two bushels of salt per acre and apply as surface dressing. For clay lands, apply by the waggon load; hardly too much can be added. Use muck also, if available. Farmers having marl deposits will do well to test their value in different lands. Small plots in a couple of fields will be sufficient. Those not having them should examine their swamps and marshy lands, and dig a few feet beneath black soils.

Lime, in the form of marl or carbonate, should not be used with manures. In the changes resulting, ammonium carbonate is formed; this is a volatile compound. Lime, in the form of sulphate, *i.e.*, gypsum or land-plaster, is best; it produces ammonium sulphate, a stable compound—in other words, it *fixes* the ammonia.

There is no market for marl at present established in Canada. Its value depends upon its situation and the nature of the surrounding land. The commercial value for lime in fertilizers is sometimes placed at $5 per ton. At that rate, Ontario dried marls are worth from $2 to $3 per ton. Rich marls are sometimes utilized for burnt lime.

ERASMUS'S paraphrase of the New Testament is clear and explanatory; but you cannot expect anything deep from Erasmus. The only fit commentator on Paul was Luther—not by any means such a gentleman as the apostle, but almost as great a genius.—*Coleridge.*

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