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The Acadian Scientist.

Institute of Science

Published in the Interests of the Acadian Science Club.

HALIFAX, N. S.

Vol. I.

WOLFVILLE, N. S., MARCH, 1883.

No. III.

A. J. PINEO, EDITOR.

OUR February issue calls for an apology both on account of its tardiness and the large number of errors that it contained. We feel disposed to cast the blame of both on the printer. The copy was in his hands in season, but owing to some unfortunate circumstances the printing was delayed for nearly a month; and then the printer in his haste neglected to send proof for correction. The second part of Dr. Dawson's interesting article was omitted, and some matter inserted for the second time, which we wished left out. All this must be more vexing to ourselves than to our readers, and we have taken precautions in order that it may not happen again. We have changed printers and employed one upon whose promptness we can rely. This number is necessarily a little late, but henceforth if subscribers do not receive the SCIENTIST by the 25th of each month they should inform us of the fact

But for the change in the appearance of our little journal we have no apology to offer. Its size has been somewhat diminished, it is true, but we think that that is more than compensated by increased neatness in style and mechanical execution, and as we shall next month add an advertising cover, even

the decrease in size will then be but slight. We were led to select this size and form as it offered an excellent basis for future enlargement and improvements, which we hope to make when our subscription list shall have sufficiently increased.

THE late Congress of the United States passed a law reducing the rate of postage on letters to two cents. The results of this change will doubtless be a large increase in the number of letters carried and a smaller proportional decrease in the number of postal cards used. We hope that our Dominion Government will not be slow to follow this example, and not only reduce the postage on letters, but make some other desirable changes. For instance, while our rate of book-postage is as low as could be expected, we are unfortunate in not having an equally cheap parcel post by which small articles could be sent at a reasonable rate. At present the collector, sending by parcel-post minerals or shells, must pay the exorbitant tax of *twenty-four cents per pound* — a rate which practically excludes such mailing. We can see no sufficient reason why such specimens should not be sent at the same rate as botanical specimens and insects, namely, four cents per lb.

[For the Scientist.]

WINTER WORK FOR NATURALISTS.

HERE in Nova Scotia, as well as in other countries with an equally severe winter climate, but little out-door work, in the way of collecting, can be done by the naturalist during that long cold season. It is true that if he be enthusiastic he will not be debarred from his favorite employment by times and seasons. He can still, with the exercise of a little perseverance, find materials for the study of insect life in decayed logs and under the loose bark of trees; he can gather mosses and fungi and make a collection of wood sections in the forest; he can secure specimens of such of our native birds as choose to remain and brave with us the frosts and snows of our northern winter rather than seek more genial climes with their summer companions. But, though work may lack in one direction it abounds in another. If he improved the shining hours during the preceding summer and autumn he has on hand, demanding his care, a large lot of specimens, uncleaned, unarranged, and unlabeled, and a confused jumble of notes that will require more than one long winter evening to decipher, rewrite, and arrange. Though he intensely enjoyed the summer's labor, he is grateful that living growing nature has, for a time, closed her doors upon him and given him, perforce, an opportunity to care for the collection that he has already made.

But it is just here that the young collector is liable to err. He is apt to forget or not comprehend the fact that a small collection, well classified and arranged by himself, is a much more desirable attainment than a large promiscuous one without order or arrangement. The collecting of specimens merely out of curiosity or for the sake

of excelling in number or quantity, as boys collect postage stamps and coins, is no part of science. The young collector should therefore remember that his work is only half done when he has brought home his specimens, but that there remains the study, arrangement, and classification of them. Of this work the greater part will usually be left till the busy collecting season is over and winter brings days of leisure. Then the keys, microscope, blowpipe, etc., can be used more frequently and the specimens prepared, labeled, and arranged in cabinets.

This is also the season for making exchanges and conducting correspondence with persons similarly situated in other countries; while the notes jotted and observations made during the preceding season should be elaborated and such parts as would be of general interest published in *THE ACADIAN SCIENTIST* or some other scientific magazine or paper.

I will just add a few hints for the benefit of young collectors. Now that the coming season is almost upon us, everything required for the campaign should be got in readiness while there is leisure. Every collector will, of course, choose some one department to which he will give his chief attention. If it be botany, collecting-box, press, dryers, etc., should be put at hand. If insect hunting is to be the absorbing pursuit, nets, hunting-boxes, and a generous supply of pill boxes and small tin boxes, suitable in size for carrying in the pocket, should be secured, as well as pins, and boards for setting and drying the insects. And similarly, for whatever other department the collector may choose, every requisite should be secured and placed in readiness.

Again, the collector needs to exercise a little moral courage in facing the inevitable ridicule of those who are so ignorant as not to understand the sig-

nificance of his work. But let him persevere, and those same persons will some day come to respect what he is doing, and what will be for better, he will himself have the satisfaction of feeling that he has added a little to the world's knowledge.

DARWIN'S RELIGIOUS VIEWS.

From Boston Journal of Chemistry.

DURING the meeting of German scientists and physicians, held last year in Eisenach, Professor Ernst Haeckel lectured on the natural religion of Darwin, Goethe, and Lamack. In the course of this lecture he made the following remarks :—

That Darwin also held to the same natural religion as Goethe, and that he was no adherent of any special church confession, is apparent to any one reading carefully his works. But as some of his countrypeople have, since his death, asserted the contrary, and as some clergymen have praised Darwin as an adherent of a special confession of the English church, I am able to introduce here an exceedingly valuable but hitherto unknown document, which will remove every doubt that might possibly exist.

A young German student, whose faith in the Christian religion had been shaken by the perusal of Darwin's work, and who had entered the intermediate stage of doubt, wrote to Darwin, for the purpose of getting the advice of this eminent natural philosopher. At first, one of the relatives of Darwin answered by excusing the latter's ill-health, great age, and want of time, which prevented him from answering the questions put to him; but the German student was not satisfied, and so he once more wrote to Darwin, begging him to help him in his dilemma. He then received the following letter, written and signed by Darwin himself :—

“DOWN, June 5, 1879.

Dear Sir—I am very busy, an old man, and in bad health, and I cannot gain the time to perfectly answer your questions, supposing that they may be so answered. Science has nothing to do with CHRIST, excepting in so far as the habit of scientific exploration makes a man cautious in recognizing proofs. As far as concerns myself, I do not believe that there

has ever taken place any revelation. But regarding a future life, everybody has to decide for himself between contradicting uncertain probabilities.

“Wishing you future welfare, I remain,
dear sir,

Very respectfully yours,

CHARLES DARWIN.

A VOLCANO.

A English lady—Mrs. Brassey—who has recently visited Hawaii, thus describes Kilauea, the largest volcano in the world : “We were standing on the extreme edge of a precipice, overhanging a lake of molten fire a hundred feet below us, and nearly a mile across. Dashing against the cliffs on the opposite side, with a noise like the roar of a stormy ocean, waves of blood-red fiery, liquid lava hurled their billows upon an iron-bound head-land, and then rushed up the face of the cliffs to toss their gory spray high in the air. The restless, heaving lake boiled and bubbled, never remaining the same for two minutes together. . . There was an island on one side of the lake, which the fiery waves seemed to attack unceasingly with relentless fury, as if bent on hurling it from its base. On the other side was a large cavern, into which the burning mass rushed with a loud roar, breaking down in its impetuous headlong career the gigantic stalactites that overhung the mouth of the cave, and flinging up the liquid material for the formation of new ones. It was all terribly grand, magnificently sublime; but no words could adequately describe such a scene.”

A naturalist may study the habits of the mosquito, out of books for years, but it is only by long and careful practice that he can learn to hit one in the dark without mashing his own nose.

THE RIGHTS AND DUTIES OF SCIENCE.

BY PRINCIPAL DAWSON, F.R.S., D.C.L.,
MCGILL UNIVERSITY, MONTREAL.

Scientific education necessarily presents two aspects: one, that which relates to the training of scientific workers; the other, that which concerns elementary and popular teaching for all. The first is necessary to secure the existence and progress and applications of science, but it must be confined to a comparatively small number. The second represents the diffusion of the benefits of science among the mass of the people; and this also is essential, both to give the public support and countenance which the scientific worker requires, and to leaven society itself with the influence of scientific training. And here I would denounce that old and evil fallacy, that a little science is dangerous. We may, it is true, have too little to be of much service, but every scientific acquisition is intrinsically worth something. The humblest object-lesson taught in a village school—on a butterfly, a flower, or a crystal—if well and truly taught, is a great and permanent gain to the learners—one that may prove the foundation of vast intellectual wealth in the future. But every thing depends on the little being good of its kind. Where a little only can be taught it should be limited to few things, and these thoroughly and clearly understood. Then will even a little learning manifestly bring the mind into the presence of the Creator's plans, and correspondingly elevate and ennoble it. It is a wonderful thing to observe how the mind of a child craves for insight into the wonders around it, and how it can grasp the comprehension of great laws of the universe, and how

it is beyond measure expanded thereby. I fear I may seem too sanguine in this matter, but I have a very deep conviction that few even of our most advanced thinkers have any just conception of the educational value of science, with reference not merely to learning, but to all our political, social, and even religious interests.

The teaching of science we have already glanced at from the side of right. Viewed from the side of duty it presents itself in a still more important aspect, since here the man of science ceases to be an isolated worker, and comes forth to make permanent impressions on the minds of his fellow-men. This is the case whether science education be undertaken as a profound and thorough professional work, or whether it be followed merely in the manner of the popular lecturer or writer.

I would here repeat, though without dwelling upon it, that the first requisite of the science teacher is that he teach in a scientific manner—that is, so far as the arrangements of educational institutions will permit. There is a constant tendency to allow science teaching to degenerate into a mere cram of text-book facts. When the teaching is carried on without proper appliances, and by teachers themselves not specialists, this is inevitable; but even where these circumstances are favorable, the teacher will find that his pupils have already, in previous stages of education, been so thoroughly trained in the system of book-cram, that it is very difficult to induce them to observe or think for themselves. I have been surprised to find that classes of young men will rather commit to memory, a dry text-book or imperfect lecture notes, than open their eyes to see for themselves and exercise their minds in perception and comparison, so thoroughly

has the natural habit of observation been crushed by previous vicious training. This is one of the first evils the educator has to counteract, the next is to cradicate the habit of receiving statements on authority, and to stimulate the mind to the contrary habit of "proving all things," a scientific as well as religious duty.

As for the science teacher himself, he must be a true learner and enthusiast in his subject. He must teach what he practically knows, and this in a practical manner, so that the learner shall know it in the same way. He must, in the order of his teaching, follow nature, and not himself merely; and he must induce his pupils to observe, reason, and judge for themselves on every point, and to receive nothing either as fact or law that they cannot explain and defend. A very little of such teaching, however elementary or however popular, may be the sowing of seed that will produce abundant harvests. It is to be observed also that in this way the teaching of science must react favorably on all other kinds of teaching. It has already done so, and will do so more markedly in the time to come. When this beneficent revolution shall be complete, we may hope to see students striving for excellence, because the appetite for study has been awakened in them, because they love learning for its own sake; not turning the weary treadmill of cram for hated examinations, or learning only because it "pays" in college distinctions or in some prize or medal or opening to professional life. This millennium of education, I believe, is to be introduced only by the extension and development of education in science.

Natural science is closely connected with our æsthetic perceptions, which are of divine origin, however much

they may become distorted and aquesed. That we know the structure of a flower and can give names to its parts, is surely no reason why we should take less pleasure in its form, its colors, or its perfume. Rather it should greatly enhance our appreciation of these wonders, so attractive even to a child. That we know the structure and age of a mountain chain, or understand something of the motion of glaciers, should surely not harden our hearts against the sublimity of Alpine scenery. Rather it should fill us with new awe, in view of the time and the forces involved in the foundation of the everlasting hills. It is not too much to say that no teacher of science whose own imagination is not fired with a sense of the beauty in nature, and who fails to avail himself of the natural feeling for beauty, can be in the highest degree successful. Nay further, in addition to taking advantage of what all can see and appreciate, he must be continually bringing into view new beauties not seen by the unlearned. Such marvelous and artistic structures as the microscope disclose, in the minute parts of plants and insects and sea-urchins, in the crusts of polycystins, foraminifers, and diatoms, and in the gills of certain mollusks, are admirably fitted to enlist the interest of learners, and to enlarge their appreciation of nature. At a time when so much that is essentially monstrous is admired as art, such culture it is especially the duty of science to give; and it requires but a limited knowledge of human nature to perceive that the mind which has lost its relish for nature's beauties, and delights itself in grotesque or hideous productions of art, is thereby degraded even morally and intellectually.

Again, the instructor in science must not teach atheistically, or even be content with that provisional materialism which one of the great popular

teaching of our time commends as expedient. Nothing can be gained by a teaching essentially false or imperfect, and which destroys that sympathy of the human soul with nature which gives to its study the greatest attractions. If, as we have already seen, mere materialism cannot explain even matter, still less life and mind, the teacher who has nothing beyond this in his philosophy is sure in the last resort to be ignominiously driven back on the absurdities of eternal succession and of order and unity resulting from chance. If he is content to postpone the difficulty by resting his faith on any of the popular forms of evolution, he is in no better position than the Hindu who supports the earth on an elephant and the elephant on a tortoise; and he scarcely improves his position by placing the tortoise on an ascidian, the ascidian on a protozoon, the protozoon on a particle of protoplasm, and the particle of protoplasm on an atom. The weakness of such a system is certain to be detected by the common-sense of his pupils, unless indeed he can succeed in reducing them to the same state of imbecility in this matter with himself, which would be a pitiful outcome of science.

Nor can the science teacher logically stop short of the fullest admission of design in nature, with all its consequences. In our time the doctrine of teleology and final causes is much scoffed at by some able scientific specialists, and many unthinking persons take up the cry and profess in this matter to be wiser than the ancients. Yet even these persons, while protesting against the idea of purpose, cannot speak of nature without reference to ideas of use, fitness, and adaptation, which, on any other theory than that of blank materialistic atheism, involve design in the fullest sense. It is surely far from the duty of science

to vitiate its teachings with the paradoxes of the "dysteleologists." It may indeed well be asked what object, either for science or humanity, can be gained by an attitude of cold negation and sour misanthropy on the part of the man of science, or why he should oppose himself to even the sentimental love of the human mind for nature. The only result can be the rendering of science itself unpalatable, and causing it to be rejected as mental food, or, if received, to fail of any healthy digestion.

This leads finally to the statement that it is the duty of science to work and to teach in harmony with the religious sentiments of mankind. When it sets itself in opposition to religion, its scepticism carried with it the double reproach of doing evil and of going out of its own way to do evil. I take religion here in no narrow sense. Let every man construct the details of his creed for himself. I take it in the broadest sense, as the development of just one idea in which Christian, Mohammedan, and heathen agree—the belief in immortality. This is the one universal religious doctrine which spiritually dignifies humanity and elevates it above the brutes. On the one hand it leads the human mind directly to God, on the other it is itself a necessary outcome of theism. Nature cannot have been without a maker, and if there is a God, all who have ever lived, to use the words of Jesus, "live into Him." In that conscription of spiritual forces which is surely as real as that of the grosser energy which works the material world, no living soul can ever die into God. Dead they may be to us, as the sunshine of last summer is dead; but living still as surely as that lost sunshine still vibrates somewhere and for some end in the universe of God. Science itself may more or less distinctly reason out this conclusion, but independently

of science it is forever fixed in the instincts of humanity, and it is madness to set it at naught.

But let us hope that such tendencies to evil companionship on the part of science as appear here and there are but eanescent, and believe that even now they are vastly outweighed by her substantial services to humanity. Let us look on the godlike form of science, as the bold and courageous investigator bringing her hard-earned trophies from every field of labor and adventure. let us look on her as the tender and loving applier of all her treasures to relieve the wants and promote the happiness of mankind; let us look on her as the wise and diligent instructress, training the minds of men into harmony with nature and with God. So shall we recognize her pivine lineaments. So shall we claim for her her rights at the hand of society, and shall rejoice in her fulfilment of her great mission in the world—a mission of which we have seen but the small beginnings, and which must go on blessing humanity, till, in the upward progress of our race and the development of the plans of God, science and religion, earth and heaven the material and the spiritual, time and eternity, become one in the light of the glory that excelleth, for they are really all one in Him who is all in all.

LITERARY NOTES.

UNIVERSALISM AGAINST ITSELF, By A. Wilford Hall, Ph., D. Hall & Co., New York, Publishers. Price \$1.00.

In this book of some 336 pages the author meets Universalism on its own ground. The various scripture texts usually quoted in its support are examined critically and made to give evidence rather in favor of orthodoxy. As a critical work this book must, we think, prove of valuable assistance to those, of whatever religious sect, who are desirous of arriving at the true meaning of scriptural teaching. It is meeting with a ready sale, over 55,000 having been already sold.

FLOWER OBJECT LESSONS, from the French of M. Emm. LeMaout, translated by Miss A.L. Page.

This excellent little book of 55 pages is designed as an aid to Teachers in presenting object lessons in botany to young scholars. Some twenty of the common plants of field and garden are examined and the floral organs observed. The aim is to lead the young to observe and think. Live teachers will recognize the value of this little work. It can be obtained from the Translator at Danvers, Mass., at 40 cents per copy.

Milford's Microcosm for February received. The most conspicuous article in this number is an open letter from a reverend gentleman in Ohio, addressed to Professors Tyndal, Helmholtz, and Mayer, summoning them most vociferously to judgment to answer for the fallacies and deceptions that they have been publishing under the name of science. We think that Dr. Hall is a little unfortunate in his selection of a herald. If he really wishes those scientific gentlemen to reply to his arguments he may be sure that they will not respond to any such invitation as that given by the gentleman in Ohio. No doubt that those addressed in the epistle will be greatly amused thereby. The large number of other articles in this magazine are of great interest and the editorial articles show large originality and acuteness on the part of their author. As the price of this valuable journal is very low it should be in the hands of every clergyman and scientist. \$1.00 a year; to our subscribers when ordered through us, 75 cents.

We have received the "American Naturalist" for March. As usual it is filled with valuable articles and the most interesting and varied information of the latest progress in the various Departments of Natural Science. The articles "On the Extinct Dogs of North America," "Organic Physics," "Indian Music," and "Pitcher Plants," will be especially interesting to the general science reader. In the Geographical Notes are striking items of news from Africa, through Stanley, Major Von Meechow, Dr. Wiseman and others; and from Aasia, through Mr. Colquhan particularly. In Geology and Palaeontology there is an admirable summary of Prof. Verrill's paper on the Physical and Geological character of the seabottom under the Gulf Stream,—the result of eleven years of explorations. The other departments, Mineralogy, Botany, Entomology, Zoology, Physiology, Psychology, Anthropology and Microscopy are also well filled. McCalla & Siavelley, Nos. 237-9 Dock St., Philadelphia, are the Publishers.

We have received from the Author a valuable pamphlet entitled, "Observations on Planorbis," by Robert E. C. Stearns. It consists of two parts: 1st. "Are the shells of Planorbis Dextral or Sinistral." The Author claims as the result of research that they are the latter. 2nd. "On certain Aspects of Variation in American Planorbis."

The February No. of the "Revue De Botanique," the monthly bulletin of the "Societe Francaise De Botanique," has been received. It contains a continuation of the Flora of one of the Departments of France, and enumerations of the European species of Polygonum &c., and some interesting notes, among which we find the following:

"ROTANY AND THE PROPAGANDA OF ROME.—The congregation of the Propaganda, faithful to its grand civilizing and religious mission, in the name of Pope Leo XIII, has just sent a circular to all the Delegates, Prefects and Apostolic Vicars which are under its supervision, to invite them to collect everything which will appear to them to contribute to the knowledge of the Natural History of each country, especially the Botany, the Mineralogy and Zoology."

THE NORMAL is a neat little educational journal published at Hollow Rock, Tennessee, with Jos. J. Losier as editor. It is a 16-page monthly full of interesting notes and valuable articles, and as the price is only 50 cents a year it should be in the hands of every enterprising teacher.

EXCHANGE DEPARTMENT.

Authors and Publishers would confer a favor upon the club and help along the cause of Science by sending papers and books. The receipt of such will be acknowledged in the SCIENTIST; and they will be preserved for the use of the members.

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Herlie E. Cook, Leicester Junction, Addison Co., Vermont, wishes to correspond with other members of the club.

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