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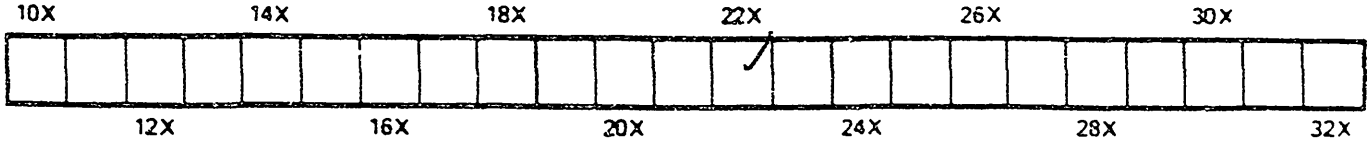

No. 8. Aug.

ACADIAN SCIENTIST.

Devoted to the Interests of Acadian Science Club, Teachers and Naturalists.

A. J. PINEO, EDITOR.

SUBSCRIPTION 35 CENTS PER ANNUM.

The Acadian Science Club.

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This Society aims to awaken and foster a more general interest in Scientific knowledge, to induce young men and young women to engage in systematic study at home, and to afford its members the means for mutual assistance in the pleasing and enobling study of Nature's works. All efforts used to make the connection of students with the Club pleasant and profitable.

A Course of Study has been arranged extending over three years and including the following subjects: Physiology, Geology, Botany, Natural Philosophy, Astronomy, Chemistry, Zoology and Mineralogy.

The members report quarterly. Yearly examinations are held at the Students' homes and at the end of the course certificates are given showing standing, etc. Course of Study and full information sent upon application to the Secretary.

GOOD WORDS.

We are receiving so many expressions of approval and good wishes from friends of education and progress everywhere that we feel inc ined to publish a few of them for the encouragement of those who are seeking to fulfil the aims of the 'Acadain Science Club" and the ACADAIN SCIENTIST, and of all who are in sympathy with them in their work. We have space for only a few representive letters.

From David Allison, L. L. D., Supt. of Education for Nova Scotia.

"I am in hearty sympathy with your movements in the direc ion of introducing elementary science in schools. * * * I shall be prepared to speak a good word for the SCIENTIST."

From Theodore H. Rand, L. L. D., Supt. of Education of New Brunswick:

"I very cordia ly approve of your effort to interest teachers in science through your publication and shall be gla l to commend it to those engaged in school work."

From Wm. D. McKenzie, M.D., Inspector of Schools, Parrsboro, N. S.:

"I am anxious for every grade B teacher in my district to become a member of the Scince Club."

From Geo U. Hay, Esq., Botanist, St. John, New Brunswick:

"I am heartily in syympathy with the objects as set forth in the SCIENTIST and will cheerfully aid in helping it along. * * * After the month of August I shall fe l more at iberty to meet your wishes in regard to writing for the SCIENTIST.

From Philip Cox, A. B., Inspector of Schools, Newcastle, New Brunswick:

"I heartily approve of the efforts of the Science Club in seeking to sow the elementary seeds of natural science among our teachers, an thereby giving more directness and method to every-day instruction in the schools. The great difficulty in the way of rendering the teaching of these subjects of much educative value is o want of system—an absence of proper knowledge, classification, sequence, etc., by our teachers—and for these reasons much time is wasted in seeking to teach classes w at is not properly understood by the instructors themselves. The subscription price seems but nominal - bearing no relation to the intrinsic value of the work. * * * If you secure the approval of our Chief Supt. of Education I will do all I can to circulate your publication within my district as I believe it wi l supply a want very much felt."

From J. B. Wina, Esq., Supt. City Public Schools, Austin, Texas:

"I am in receipt of the first number of the ACADIAN SCIENTIST. I am pleased with its plans and purposes. The motive of the 'Club' is the noblest of the noble—'to encourage young men and women who are not able at present, from any cause, to enjoy the advantages of an academic or collegiate training, to undertake and continue a systematic course of study at home.' The plan is a novel one; and I have no doubt will meet with abundant success."

From D. P. Wetmore, Esq., Inspector of Schools, Clifton, N. B.:

"I am much interested in the Club, and will do all I can to increase its membership among the teachers here. * * * Would like to enroll myself a member of the Club.

ISAAC N. HALLIDAY, PRINTER, HALIFAX, N. S.

The Acadian Scientist.

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☞ The subscription price is only thirty-five cents a year. Canadian or United States stamps taken; denominations of 1 cent or 3 cents preferred.

TO OUR READERS.

We anticipate for our little journal, in consideration of the wide sphere of usefulness that it is designed to fill, a successful future. The field is, we think, unoccupied by any other publication in America. We aim to make the SCIENTIST of interest to Teachers by giving from time to time lessons and notes upon the teaching of elementary science in the public schools; to amateur scientists, young collectors, and boys and girls who wish to begin the study of nature and the collecting of specimens, by giving instructions and practical hints such as they need; and also to the general reader, by giving a monthly summary of scientific news such as every intelligent man should know. We feel conscious of the fact that our aims have thus far been but very imperfectly fulfilled, but the scores of kindly letters, highly complimentary and wishing us success in our enterprise, that we have received from friends whom we have never met, are very encouraging, and lead us to believe that the world is not so coldly critical after all. And so, with such encouragement, we feel strong in hope and determination for the future, and shall aim, by making improvements in the SCIENTIST as rapidly as possible, to merit the confidence of our fellow-workers and the public generally. With your assistance we hope to gradually enlarge the SCIENTIST until, by the beginning of the next volume, it shall be more than double its present size. You can help us by sending in your subscription, if you have not already done so, and by inducing others to do the same. The entire income for this year, at least, is to be spent in improvements. For our own labor we do not ask any remuneration —it is freely given.

Communications of the right sort are always welcome to our columns. Have you been off on a vacation trip to some locality of scientific interest, write it up for the SCIENTIST. Have you made any discovery in natural history or any improvements in the ordinary methods of collecting and preparing specimens, report the same to the SCIENTIST. Have you had any experience in teaching elementary science, give your fellow-laborers the benefit of it through our colums. Your lamp will burn none the less brilliantly for lighting your neighbor's.

(For the SCIENTIST.)

BOTANICAL NOMENCLATURE.

BY PROF. A. H. MCKAY, A. B., B. Sc.

The species of the vegetable kingdom are so varied and numerous, that no botanist could have anything more than the most confused idea of the *flora* of any portion of the world were there not a good system of classification. In the pools of water in our swamps and marshes are found one-celled organisms, so minute that to the naked vision they never become visible. Such especially are the superbly picturesque green *desmids*, the exquisitely sculptured siliceous *diatoms*, and the still more minute but more redoubtable *acteria*. Then there come the filamentous algæ trailing the most gorgeous trains of nature's own spinning across the surface of the foul ditch under the guise of a dirty slime to the vulgar gaze, and the laminated or feathered denizens of the briny deep. The naked rock, the barren wall, the dry tree trunks, are frescoed with a hundred forms of various colored lichens, while the fungus rankles in the moister shades below. Then there are the dainty mosses and liverworts with their capsuled spores and leaves of every shade of green; the graceful ferns, the glorious flower, with the murmuring pine and the hemlock. A natural system of classification as opposed to an artificial system, will group these, not according to some convenient mark or character simply, but in accordance with their general structure, or their natural relationship. Thus the diminutive strawberry is placed in the same family as the huge apple tree. A family of plants, then, according to the hypothesis of modern evolution, would indicate a group of species and genera which might have been descended from some single plant long ages ago. By such unaccountable changes as we see take place to a small extent in the cultivation of plants to-day, it is supposed that in the course of ages, by a wide distribution, under diverse climatic conditions, plants changed their forms as did the languages of men. Perhaps, then, all plants were ultimately derived from some one original form. Such an hypothesis is of course very difficult of proof; but as it forms a very convenient and natural basis of classification, which is not positively negatived by any known fact, it is therefore at least a good working hypothesis to enable us to arrange our knowledge and ultimately discover new truths. We have all vegetation, therefore, divided on this hypothesis of general relationship into series, or classes and sub-classes, down until we come to the family or *Order*. These have their names ending uniformly in *æ*. The why of it is this: The name of the order is the Latin adjective qualifying, and therefore agreeing with the plural noun *plantæ*—plants. Thus *plantæ rosaceæ* means "rosaceous plants," *plantæ leguminosæ*, "leguminous plants." For brevity, therefore, the Latin adjective is used as the full name.

The order is often divided for convenience into tribes and sub-tribes.

But the principal division is the *genus*, plural *genera*, another Latin word. The genus is a group of much closer resemblance or relationship than the order. No definite rule for what constitutes generic relationship has yet been laid down. Consequently we often find the older genera of botanists broken up or re-arranged by later botanists. The *species* is the individual. This is another pure Latin word. And as it is of the *fifth declension* according to the grammarians, its singular and plural are alike. A plant is botanically named, therefore, by giving its generic, followed by its specific class. Thus, *Trifolium pratense*, L., is the Red Clover, *Trifolium, repens*, L., the White Clover. Or, if we translate the names in the Latin order, they are, the "Clover of the Meadow" and the "Clover Creeping" —the specific or adjective name coming last. As some of the older genera as mentioned above, have been recast, it follows that a plant may be known by different botanical names in many cases according to the author followed. It is often useful, therefore, to place the initials of the author after the specific name. Thus the L. in the above names stands for *Linnæus*. For instance, our common wild strawberry is the *Fragaria Virginiana* of Ehrhart, and the *Fragaria Canadensis* of Michaux. Our common purple-fringed orchid is the *Habenaræ psycodes* of Gray, *Orchis psycodes* of Linnæus, *O, fimbriata* of Pursh and Bigelow, *O, incisa* of Muhlenberg, *O, fissa* of Wildenow, and *Platanthera finibriata* of Lindley. This last, of course, is an extreme case, but it illustrates the advantage of remembering the author. It is not necessary however. For in Nova Scotia a botanist is supposed to follow Gray's Manual if he does not specify to the contrary.

Some people affect a great dislike to these Latin names. But why? If the plant is known the Latin name is as plain as the English, and often much more easily spelled. A person who is not a classical scholar need not be afraid of bad quantity or the wrong accent in these days of degenerate classics, for some of our best botanists would most pertinaceously shock the ears of a polished Roman. In Gray's Manual, an excellent guide to pronunciation is given by the use of the acute and grave accents. When we notice that such local names as "Snake Berry," "Evil Weed," "Maiden Hair," "Mayflower," mean different plants not only in different countries, but often in different counties, and sometimes in different localities in the same county, then we cannot help feeling the necessity of using international, cosmopolitan and unambiguous names—the scientific names of our standard manual.

[For the SCIENTIST.]

NATURAL HISTORY LESSONS.

III.—INSECTS.

School work should be done in the department of entomology during the summer months, as then the pupils will have an opportunity of continuing the study out of doors while their interest is yet fresh. If the teacher succeeds in leading them to do so he has gained his object, no matter whether the facts he has presented be few or many. He must remember, however, that by telling the pupils in regard to the objects used what they would be able to discover for themselves, he is not only detracting from the value of the work, but actually making it less interesting, for every child is a born naturalist, and will eagerly enter into the study of nature when once he finds out that he can do so and that there are discoveries that he can himself make.

In presenting lessons on the above subject it does not matter much with which order one begins; but as the Lepidoptera form an interesting class, and specimens are abundantly at hand, it might be well to begin there. In Academies and advanced grades of High Schools, however, the work had better be taken up in a more logical order. Specimens must be used and a set should be provided for each pupil, or, at least, for each couple when two occupy the same desk. Each set should consist of two specimens, a butterfly and a moth, representing different families of the same order. Common specimens are best. A more complete set would be two specimens of each, one showing the upper surface and expanded wings, the other the under side with wings folded. These should be mounted with insect pins on sheets of cork of proper size, the butterfly and moth being placed side by side on the same sheet. If cork is not at hand, a substitute that will answer nearly as well may be made from pieces of pine board cut to the proper size. These should be planed down three-eighths of an inch or less in thickness. Small holes should then be made with an awl nearly through the wood, at points where the pins are required to be set, and these filled with beeswax for holding the pins.

Placing the specimens in the hands of the pupils, ask them to observe the characteristics of each and compare the two, noticing wherein they resemble each other and wherein they differ. About half an hour should be devoted to studying the specimens and taking notes thereon. For a subsequent lesson each pupil should write up from memory, with the aid of his notes, a full description of the objects studied. In most cases the pupil will, when it becomes necessary for him to write said description, go out and collect specimens for himself for further examination, as, with natural pride, he will wish to make his paper as complete as possible. If so, one very important end is thus far obtained. When the next half hour for natural history comes around, each pupil should be requested to read his description. None will, of course, be complete. One will have noticed certain points overlooked by others, while some features will have been observed by all. The specimens should be again handled, and characteristics overlooked pointed out by the teacher. The pupils will notice that the antennæ of the butterfly are club-shaped, while those of the moth are filiform or pectinated, and may be told that by that difference the families can always be distinguished. They will observe the honey proboscis, but will need to be told that it is made by two prolonged lateral jaws joined together to form a tube. They will, perhaps, remark upon the eyes, and may be told that these are compound organs, being made up of a large number of facets or lenses, which circumstance more than compensates for inability to roll the eye as we are able to do. They will notice several things about the wings, particularly that they are covered with a powdery substance, and should be informed that this is not "feathers," but scales that overlap each other as those of the fish. A good microscope would reveal to them more fully the nature of the substance. They will have written something about the legs and abdomen, about the form and color, and will, perhaps, have observed the insects in their flight. Perhaps no one pupil will have made all these observations, but each will feel a little surprised that he should have omitted any, and will mentally resolve to be more thorough in future.

The teacher should then describe and illustrate by means of specimens the several stages of the insect's life—

the egg, the larva, and the pupa. The pupils will then be able, and should be required to, write a full description of the butterfly and moth, including their life history, and present the same neatly written in a blank book kept for the purpose. They should also be shown how to breed the insects and watch the transformations for themselves.

For the ACADIAN SCIENCE CLUB.

LECTURES ON MINERALOGY.

II.—BLOWPIPE ANALYSIS—*Continued.*

Determining the fusibility is often a very important means of distinguishing minerals. A pointed fragment is held by means of platinum wire, or better in platinum-tipped forceps, in the flame of the lamp. If it does not fuse apply the O. F. of the blow-pipe; never use the R. F., because its action might cause change in composition. Care should be used in general not to let the fused part come in contact with the platinum, for it would be injurious if sulphides or metals were under treatment. Powders may often be tested in the same way if they are first mixed with water to a stiff paste, spread on coal and gently heated in the O. F. until hardened to a crust, which is then lifted off and placed in the forceps. If the substance decrepitates or flies to pieces in the flame it must be first heated in a closed glass tube until decrepitation ceases, then tested as above. The fusibility of metals and substances generally that have a metallic lustre should be determined on charcoal.

Observe carefully during the heating whether the substance bubbles and swells (*intumesces*); throws out sprouts (*ramifies*); swells and curls up (*exfoliates*) with or without fusing; whether the fused mass is clear and glassy; enamel-like; made opaque by numerous very small bubbles forming a *blebby glass*, or is only partially fused to a vesicular scoria; all of these being very important. The lens will be found useful in these observations.

The following minerals form a good scale of fusibility:—

1. Stibnite, fuses readily in lamp flame.
2. Natrolite " with difficulty in " "
3. Almandite fuses easily in B. P. flame.
4. Actinolite, less readily " " "
5. Orthoclase, with difficulty " "
6. Bronzite, edges only slightly rounded in B. P. flame.

Closed Tube Tests.—The tubes for these tests are best made by the student. Get a stick of thin glass tubing about one-fourth of an inch in diameter. Cut it in pieces about 5 in. long by scratching with a file, then breaking. Heat these pieces in the middle by the lamp, using the B. P. if necessary, and by drawing out the softened glass seal the end of each piece.

A piece of the substance to be tested, the size of a grain of wheat, is crushed to a coarse powder and placed at the bottom of the tube. The glass above should be cleaned by a bit of paper. It is then carefully heated in the alcohol flame. Finally the strong heat of the blowpipe is applied and the appearances noted. *Charring* indicates organic matter, and in that case the odor of burnt sugar, feathers or coal is generally noticed.

Water condensing on the tube may be mechanically combined with the substance, or if it had been dried it is due to water of crystallization, or comes from hydrated oxides.

GASES OR FUMES ARE EVOLVED.

Oxygen rekindles or causes to glow more brightly a splinter of wood having a spark at the end, when introduced into the tube. It is given off by oxides, chlorates &c.

Exp.—Try the test, using potassium chlorate.

Ammonia, recognized by its color, is given off by some ammonia salts.

Iodine gives violet fumes.

Nitrates give off reddish brown fumes.

A sublimate forms, i. e, the vapor condenses to a solid on the cool part of the tube.

1. *White sublimates* denote ammonium salts arsenous oride (*in octahedral crystals*, seen with a lens.) Mercury chlorides.

2. *Colored sublimates.* — Brownish-red when hot, yellow on cooling, shows sulphur.

Exp.—Try iron pyrites.

Brownish-black when hot, reddish-yellow on cooling, indicates sulphide of arsenic; black while hot, brownish-red when cold, sulphide of antimony; dull black, giving a red powder when taken out and rubbed on paper, sulphide of mercury; lustrous, black, metallic and crystalline when abundant, metallic arsenic; grayish-white mirror-like film, collecting into globules on scratching, mercury.

Borax Bead Tests.—Many substances impart a characteristic color to melted borax, affording a very delicate means for their detection.

The borax bead is formed by making a small loop at the end of a platinum wire, heating it to redness and suddenly dipping into powdered borax, then heating it strongly in the O. F. until a clear glass is formed. If a round bead is not obtained at first, dip again in the borax and heat. Substances are brought into the bead by simply touching it, while still hot, against them, and then fusing the bead again to dissolve the substance. Metals do not dissolve in fluxes, but the oxides do. Substances that contain sulphur or arsenic should be carefully roasted on charcoal, after being pulverized, as these elements interfere with the test. The former element may be detected in this process by the odor of burning sulphur, and the latter by a garlic odor.

The following are the appearances given by the oxides that produce the most characteristic reactions with borax:—

Iron in O. F., brown to yellow while hot, colorless when cold, unless highly saturated, when it is yellow on cooling; in R. F., bottle-green.

Copper in O. F. greenish blue while hot, light-blue on cooling; in R. F., opaque red.

Cobalt, deep blue.

Nickel in O. F, hot, violet; reddish-brown on cooling; in R. F., grey to colorless.

Chromium, green.

Manganese, in O. F., amethyst-red; in R. F., colorless.

The student should practice these tests on substances of known composition until he is very familiar with them before he attempts to work on unknown substances. Considerable practice will be required before a good reducing effect can be produced. The manganese bead will be the best to work with (using the mineral pyrolusite to produce it,) changing it from one flame to the other after the characteristic appearance is produced.

S. K. HITCHINGS.

[To students who may find difficulty in obtaining the platinum wire mentioned above, I will send pieces of sufficient length—about two and a half inches—for 10 cents each—the actual cost.—Editor SCIENTIST.]

[For the SCIENTIST.]

THE TEACHER AS A STUDENT.

While many of the teachers of our public schools are conscientiously seeking a better preparation for their work, striving to gain greater efficiency each day, constantly looking for better methods, and drawing information from every legitimate source available, many others are content to assume the responsibilities of their position and drag through the monotonous routine of daily work in a mechanical manner, as though it were inert matter, not quickening thought and growing intelligence and plastic character which it is their duty and privilege to direct and nobly impress. The teacher who has ceased to be an earnest student has also ceased to be qualified to lead others into green pastures of knowledge, for by example as well as by precept do we, teach, and with perhaps more lasting influences by the former, and that teacher must ultimately fail of success who, through indolence or carelessness not only neglects thorough preparation for each day's labor in the school-room, but also the building up day by day, from various sources and by multiplied means, of a broad general culture. We know teachers who never subscribe for nor read an educational, literary or scientific periodical;

who never buy a book, except it may be the last "Seaside," and who know little or nothing of what is taking place in the great world around them. Would it be any wonder if such a teacher should fail to interest his pupils or to inspire them with enthusiasm in their work? Would it be any wonder if such a teacher should never rise above the ranks of mediocrity, or perchance never reach so high, but rather, by not having his mind cultured by systematic study, should fall behind in the march of progress.

Every teacher should set for his goal the highest attainment possible to him in his profession. He will thereby fulfil most nobly his high mission in life, and will, at the same time, it is needless to say, gain greater worldly advantage. The law of supply and demand operates in the teaching profession as elsewhere, and while there is crowding and sharp competition in the lower walks, there is always "room at the top." PEDAGOGUE.

THE ANTIQUITY OF MAN—An interesting discovery, of much importance for geological and archæological science, was recently made in a coal mine at Bully-Grenay, in the French department of Pas-de Calais. A new gallery was being pierced, when a cavern was broken into, which discovered the fossal remains of five human beings in a fair state of preservation—a man, two women, and two children composed the group. The man measured about seven feet, the woman six feet, and the children four feet and rather less than this. In addition, some fragments of arms and utensils of petrified wood and of stone, with numerous remains of mammals and fish, were brought to light. A second subterranean chamber inclosed the remains of eleven human bodies of large size, several animals, and a large number of various objects, with some precious stones. The walls of the cave exhibited drawings representing men fighting gigantic animals. Owing to the presence of carbonic anhydride a third and larger chamber, which appeared to be empty, was not searched. Five of the petrified remains will be exhibited at the mayoralty of Lens. The remainder of the bodies brought to the surface are to be conveyed to Lille, there to await a thorough examination by the experts of the Faculte des Sciences. Information has been telegraphed to the representatives of the Academie des Sciences of Paris and those of the British Museum. If the discovery be a real one, no doubt can be entertained of the value of the find, which would on the face of it seems to show that prehistoric man is anything but a myth.—*Lancet.*

NEWS AND NOTES.

The thirty-second meeting of the American Association for the Advancement of Science will be held at Minneapolis, Minn., beginning Aug. 15th, and closing Aug. 21st.

Geological examination reveals in the delta of the Mississippi, along a space of 300 miles, ten distinct forests of buried trees. Bald cypresses, with a diameter of twenty-five feet, have been found.

SEA WEEDS AND LAND WEEDS.—London papers say that "the secretary to the Royal Botanical Society recently tried the novel experiment of planting sea weeds in ordinary earth. It would naturally be supposed that these 'flowers of the ocean' would not flourish away from their native element; but this is not the case, most of the specimens planted having grown admirably in soil which is constantly kept in a moist condition." The result is both curious and suggestive, and worthy of trial this side of the ocean.

The first Walker prize offered last year by the Boston Society of Natural History, was awarded to Howard Ayres, of Harvard University, for an essay on the Embryology of Œcanthus nivens, the tree cricket. This year, besides the regular Walker prizes, special prizes of like amounts—first, $60 to $100, and second, $50—are offered by a member of the Society, on the following subject: "A study of the venation of the hind wings of Coleoptera, with illustrations of all the families of Le Conte's and Horn's classification." The essays are to be sent to the Secretary on or before April 1, 1884.

Doryphora decem-lineata is spreading fast, but will do little damage this year.

Messrs. Fouque and Michael-Levy have demonstrated by experiment that granite, gneiss and their enclosed minerals are not the result of igneous fusion.

The British "Council of Education" has established a committee of Economic Entomology, and among other able members appointed are Profs. Huxley, Westwood, Wrightson and Dyer, and Miss Omerod

Portions of the forest in Pictou county have been stripped of leaves by the larvæ of *Clysiocampa sylvaticæ*—the forest-tent caterpillar. Poplars, birches, and alders, have been especially well bared. Some trees are pushing forth leaves again. The larvæ were going into their cocoons about the first of July, and about the end of the month the moths were out busily engaged in depositing their eggs. It would be interesting to know in what other portions of the Province the same destroyer has appeared.

LITERARY NOTICES.

THE DISEASES OF MEMORY. By T. H. Ribot. No 46 of the "Library of Science." Price 15 cents. A profoundly interesting work, full of curious facts. But it is more than that: it is a philosophical study of the phenomena of memory as exhibited in sundry forms of mental disease. It offers a scientific explanation of many abnormal conditions of memory which from time immemorial have puzzled students of mental science. The book will be read with interest by all who believe that "the proper study of mankind is man." We will send the work postpaid on receipt of price.

The *American Naturalist* for July contains as usual over 100 pages of valuable and interesting original matter, and notes on scientific progress. The longer articles are "The Naturalist Brazilian Expedition second paper," "Growth and Developments," "Pearls and Pearl Fisheries." Part II. "Catlinite, its antiquity as a material for tobacco pipes." The general notes on the various branches of Natural Science, occupying over 40 pages, are so numerous and condensed that it is impossible to give an idea of their value in our limited space. It is but a cyclopædia of current discovery in Natural Science.

HEALTH. Edward Smith, M.D. Halifax, N. S., A. & W. Mackinlay.

We have examined this little volume of nearly 200 pages, and think it to be an excellent little manual, admirably adapted to fill the purpose for which it was designed, viz., "a Handbook for Households and Schools." While the subject that forms the title is being carefully studied by earnest investigators it is a patent fact that its essentials are being grossly neglected by the masses. There is need, therefore, of more popular enlightenment on this subject; and as the foundations of nearly all great social reforms are laid in the school room it becomes incumbent upon the faithful teacher, for the good of society as well as for his own physical well-being, that he both practice these principles himself and teach them to those under his care. He will find this little handbook valuable as a personal guide into the way of health, and also as furnishing topics and matter for a series of school lectures.

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