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No. 1. January.

1884.

THE Acadian Scientist,

DEVOTED TO THE INTERESTS OF

THE ACADIAN SCIENCE CLUB, TEACHERS AND NATURALISTS.

The Acadian Science Club,

A CANADIAN NATURAL SCIENCE ASSOCIATION.

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.

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A. J. PINEO, WOLFVILLE, N. S.

CONTENTS OF THIS NUMBER:

* Written for the SCIENTIST.

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DR. STEELE'S ONE-TERM SERIES IN ALL THE SCIENCES.

I

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A notable feature is the author's charming "style," fortified by an enthusiasm over his subject in which the student will not fail to partake. Believing that Natural Science is full of fascination, he has moulded it into a form that attracts the attention and kindles the enthusiasm of the pupil

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This work is mainly composed of answers to the Practical Questions and solutions of the problems, in the author's celebrated "Fourteen-Weeks Courses" in the several sciences, with many hints to teachers, minor tables, etc. Should be on every teacher's desk.

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The Acadian Scientist.

VOL. II. WOLFVILLE, N. S., JANUARY, 1884. No. 1.

The Acadian Scientist,

A MONTHLY MAGAZINE,

Devoted to the interests of Education and Popular Science, and designed to assist all classes, but especially the young, to the reverent study of the Works of Nature.

A. J. PINEO, EDITOR AND PROPRIETOR.

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We wish to increase our subscription list. Our desire in this direction is prompted by two principal motives. First, we should like to place the SCIENTIST, upon a paying basis, and a large increase in the number of our subscribers would seem to be a movement in that direction. Second, we, in common with the other Directors of the A. S. C., are anxious to see the aims of that Society promoted. and therefore wish to bring it to the notice of thoughtful young men and young women everywhere, trusting that as soon as they become acquainted with the real intent of our undertaking, (which they will be able to do by reading a few numbers of the SCIENTIST,) they will place themselves in hearty co-operation with us. But just now the latter motive is uppermost, and we feel like ignoring the former for a time and making the following

Special Clubbing Offer: In clubs of five new subscribers, 30 cents each and a copy to the one getting up the club. In clubs of ten new subscribers, 25 cents each, and one free copy as before.

This offer holds only to March 1, 1884.

Will not many of our young friends take advantage of this offer, and thus not only secure for themselves a free copy of the SCIENTIST, but at the same time, assist in spreading a knowledge and enlarging the influence of the *Acadian Science Club.*

The SCIENTIST will be enlarged as rapidly as circumstances will allow. By sending in your subscription, if you have not already done so, and persuading your friends to do likewise, you will enable us to earlier make the desired improvements.

We would direct the attention of Teachers to the valuable series of papers on Entomology, commenced in this number by Dr. White. A little attention given now by teachers and pupils to the suggested preparations, a little time each day or each week to collecting during the summer, would awaken an intense interest in the pursuit, an interest that would spread throughout and savor all school work. For "every child is a born naturalist" and needs only a little encouragement, and a little wise direction to become a keen and interested observer of Nature. Specimens of insects could be sent to Dr. White for naming, and we assure teachers that they would find correspondence with that gentleman an extreme pleasure.

Several copies of the SCIENTIST have been sent to a number of the teachers of Nova Scotia, who have not yet favored us with their subscriptions. We have sent them trusting that those teachers would find our little journal of some worth; and we should like to continue doing so but the publication of the SCIENTIST is a somewhat *expensive* undertaking, and we are obliged to curtail our subscription list to paying subscribers.

Astronomy.

THE WINTER HEAVENS.

The heavens are now presenting a very brilliant appearance. In the early evening the beautiful planet Venus shines conspicuous in the western sky. At the same time in the eastern heavens may be seen Saturn and Jupiter, and later in the evening, Mars. Near Saturn is the bright star Aldebaran in Taurus. This star is in the angular group called the *Hyades*, situated a little south of the *Pleiades*.

South-east of these groups is the glorious constellation Orion, one of the most conspicious objects in the winter sky. It is easily known by three bright stars of the 2nd magnitude in a straight line, equidistant and occupying three degrees of the heavens. These are the *belt* of Orion, but they are also called the three kings, and in Job the *Bands of Orion*. They are also called the ell or yard, and form a convenient unit for celestial measurement. In this constellation are two stars of the first magnitude, Betelgeux and Rigel. They are situated in a line at right angles to the belt, the former about 10 degrees north and the other about the same distance south. From the belt may be found Aldebaran and Sirius, the latter the brightest star in the heavens. To find the latter pass an imaginary line through the belt and extend it about 20 degrees to the left or east and it will go a little above a very bright star, that is Sirius. If the same line be extended to the right or west it will at about the same distance pass above the conspicuous star Aldebaran mentioned before as being in the Hyades.

Directly east from Betelgeux at a distance of 26 degree is Procyon. The three stars, Sirius, Procyon and Betelgeux form an equilateral triangle. At 23 degrees from Procyon in a northerly direction are two bright stars 6 degrees apart called Gemini or the Twins. These are Castor and Pollux, the latter being on the left.

NOTE.—In the ACADIAN SCIENTIST for April on page 5, first column, 18th line from the bottom, Arcturus is by mistake used for Aldebaran.

A. E. COLDWELL.

Botanical Department.

AMONG THE CRYPTOGRAMS.

Conducted by Prof. A. H. McKAY.

STICTA PULMONARIA.

NO. II.

Last month we made our acquaintance with the common and picturesque lichen *Usnea barbata*. This month we shall take another common lichen as a still further illustration of what a lichen is. On the bark of large hardwood trees, maple especially, we very usually find a large leafy form of vegetation of a greenish or olive colored hue, sometimes of nearly a dull lead colored brown. In England it is called the "Lungs of the Oak" on account of its great abundance on the rugged bark of that tree. It is generally known, however, as the "Tree Lungwort." Its botanical name is *Sticta Pulmonaria*. The name of the

genus *Sticta* is probably derived from the Greek *stiktos, spotted,* in allusion to the white spots which are found on the under side of the lichen. Its specific name we shall notice again. Let us get specimens from the woods and read this with the specimens before us. Otherwise our labor will be lost. We must educate our eyes. To read this article alone is simply a waste of time. It will improve neither the memory, the taste, nor the patience of the reader unless he uses it as a guide to the observation and study of nature.

Well, in taking a specimen in the haud, we observe that the lichen has a point of attachment to the bark of the tree on which it grew. It grows in a flat leaf-like expansion—that is the *thallus* is *foliaceous.* It has numerous lobes, expanding from a centre, as it were. The lobes are not simply round; they are rounded with deep incisions running up between the different lobes, and the ends of these are *retuse,* that is, instead of being rounded out they are slightly rounded *back.* Instead of the outline of the ends of the lobes being convex they are markedly concave. If the end of a lobe were square as if it were cut off, it would be said to be *truncate* When, instead of being *square* the outline is *concave* it is said to be *retuse.* The surface, as has been mentioned, is of a greenish tint, sometimes with various degrees of brown in it. The *thallus* itself has a heathery *coriaceous* character, and is honeycombed with large and deep depressions—technically *reticulate—lacunose.* The surface is sometimes roughened with little spots, rather pale in color, which are called *soredia.* When the frond or leaf of the lichen is fertile, the *Apothecia* which contain its spores are generally found near the margin. They appear as small round disks, flat on the frond, but rising a very little above its general surface. The color of these is sometimes the same as that of the frond of the thallus, but generally browner. Inside of these are the spores which reproduce the plant, but as their examination would require a microscope, which many of my readers may not have, we shall omit these characters for a more advanced lesson in the future. Looking now at the under side we find it to be covered with a very fine brownish down, which may be described as *brownish-tomentose*; but it has many naked spots which are perfectly white. These naked spots so characteristic of *sticta* as to the origin of the generic name are called *gibbi.* The specific name *pulmonaria* from the Latin *pulmo,* the lungs, was given probably on account of its real or supposed efficacy in pulmonary or lung affections; or on account of a fancied resemblance between the reticulated-lacunose thallus and the mesh-like structure of the lungs.

It contains a small amount of starch, some gum, bitter and astringent principles, and a brownish coloring matter. At one time, in England, on account of its starchy and gummy properties, it was boiled down into "teas" and "jellies" for invalids suffering from lung affections. In Sweden it was customary to use it in times of epidemic catarrh for cattle, and especially for sheep. In Germany, for a similar purpose probably, it was given to cattle with salt. In human medicine it was very considerably used at one time as a tonic and astringent in quite a variety of diseases. Its astringent principle made it in some cases useful in tanning, and its bitter principle valuable to the brewer as a substitue for hops. It is said that a Siberian monastery once acquired a celebrity for its beer which was flavored with the bitter principle of this lichen.

Its coloring material has been utilized in Great Britain by the peasantry, who have applied it to the dyeing of stockings, yarn and woollen goods. In the Scotch Lowlands it is one of the "Crottles;" in the North of Ireland "Hazel Rag" or "Hazel Crottles;" in the Western English Counties, "Rags." It is also used for similar purposes in some parts of Germany and France. In some parts of Pictou County we have heard it called "Hyssop." And by some people a warm decoction of it, sweetened, is recommended as being good for a "cold." Popularly, however, it merely goes by the humble name of moss here, although some people call it the Tree "Lichen;" and we have never known of its being put to any economic use. In tropical countries some species of *sticta* are very beautiful and are in great profusion, frequently completely covering the trunks of huge forest trees. In Fuegia, Juan Fernandez and New Zealand a golden yellow sticta is quite abunda' ., and is described as being very beautiful. *S. pulmonaria* occurs on the Himalayan Mountains, but does not appear to be widely diffused over other parts of the world.

NOTES.

The catalogue of Canadian Plants, Part 1, Polypetalæ, by Professor John Macoun, which has lately appeared as one of the publications of the Geological and Natural History Survey of Canada, is a publication of much promise. It includes 907 species, although extending no further than the end of the Polypetalæ The distribution of these plants throughout the wide Dominion is given. We observe the names of several Nova Scotia botanists as the co: respondents of the energetic Professor.

Professor George Lawson, Ph. D., L. L. D., F. R. S. C., read a paper before the Nova Scotia Institute of Science on the "Northern Limits of Indigenous Grape Vines on the Atlantic Coast Districts of North America."

Principal McKay of the Pictou Academy is studying the diatomaceae of Nova Scotian lake deposits. He would be obliged by receiving specimens of the ooze or deposits from the bottoms of lakes or ponds, and will give the results of his examination to those sending such specimens. The Diatoms are among the lowest order of plants, microscopic in size, unicellar, with the power of motion when living, and most exquisitely sculptured rock crystal cell-walls. They belong to the algae. The accumulation of these flinty cells forms sometimes large deposits of what is called *infusorial earth.*

Entomological Department.

Conducted by Dr. J. E. White.

PRACTICAL ENTOMOLOGY.

NO. I.

In taking charge of this department of the Acadian Science Club's labor, I wish to ask from the members such good will and indulgence as should be accorded to anyone whose desire to be of assistance to them is much greater than his ability; and I am encouraged to venture to fulfil what will be a great pleasure to me, by the kindly feelings which are known to be in every one's breast for those who have thoughts and labors kindred to their own.

For beginners only in the study of Entomology, the papers which will appear hereafter are suitable, and as such only must be judged.

I feel it would be absurd to launch out into technical dessertations month after month, and therefore will go on step by step, so that all may keep up; though some may think I am doling

out the "pabulum" with a very niggardly hand. Still they must recollect that the digestion of some is not so vigorous as theirs, and preserve their activities until the collecting season, when they will have ample occupation.

The first thing is to get prepared for the pleasure in store for you, during the coming summer, and secure the necessary appliances, which are as follows.

Cases.--For this year, you will do very well with a half a dozen or more *cigar boxes*, what are called *half size.* These can be got by asking for them of anyone who sells cigars. Now, get a good piece of sheet cork, and cut it into pieces one inch square; glue these on the bottom of the box, half an inch between each piece. When dry and firm make a paint of equal parts of arsenic and chalk and add enough boiled linseed oil to make an ordinary paint; Add a little dryer to this, paint the inside thoroughly, and when it is dry your boxes are ready. Put them away, *lid downwards always, full or empty.*

If the flat sheet cork cannot be procured ordinary bottle corks can be cut to suit When the box has been filled with specimens put it away carefully in a dry place, and also with it any memoranda connected with any of the specimens, for the season. Absolute dryness is necessary to prevent "*grease*" which appears on insects after a year or two, and is the result of imperfect drying. These boxes ought to be prepared at once.

Besides these you will require pill boxes of different sizes, small paper boxes, such as sedletz powders are put up in, and some cotton wool in each It is well to put a number on each box, and as you will not be able to get along without a memorandum book, the corresponding number in it will give time and place of capture, and any other note necessary, and serve to bring it fresh to your memory, months after.

Exchange cases and cabinet cases I will speak of at another time when you will require them. but anyone wishing information in regard to them may write to me.

Pinning.—English pins are those most in favor. Place *all* the insects two thirds up the pin, uniformly. "High" mounting is more convenient than "low" mounting, the prevalent mode in England. All the insects of the order Coleoptera are to have the pin passed through the right elytron or wingcase; in the other orders it is passed through the centre of the thorax. Insects too small for mounting on pins are to be gummed with a strong solution of three parts of gum tragacanth, and gum acacia one part, and a small quantity of corrosive sublimate added to the water, first to a triangular piece of cardboard, an inch long and a quarter of an inch at the base. The insect is put on the apex with the gum, and the pin goes through the base. In this way many small insects can be put on one pin, in storing away. Some ought to be gummed sideways, such as small weevils, those whose heads are curved very much downward. Their profile shews them to better advantage, I will have something more to say in regard to pins in a month or two.

Best mode of Killing Insects.—It is very desirable that death should be as speedy as possible, and though I could enumerate dozens of modes, what has proved most expeditious and convenient is only to be recommended. First stands the *Cyanide Bottle.* Get a quinine bottle or a wide mouthed one, about two inches in diameter, convenient to carry, having a large tight fitting cork. Into this put two ounces Cyanade of Potassium, finely powdered, mixed with an ounce of Plaster of Paris and water sufficient to make a paste. Leave it to set in the bottle, and

if it should be moist add a little more plaster, then cork tightly Remember insects are to remain in the Cyanide Bottle only long enough to extinguish life; if left longer they get extremely rigid and are not easily set up. Remove the specimen to a pill or paper box, number it and make a note of it in your memorandum book. The pill boxes should always contain a little cotton wool, it prevents the specimens from being injured during a collecting tramp.

For large insects, which cannot be got into the bottle, a drachm vial of very strong solution of Cyanide of Potassium is convenient. A match dipped into it and held under the thorax, while you hold the insect with the finger and thumb, will extinguish its life in a few seconds. *Chloroform* is also required, and while for large insects you may try the effects of a few drops on cotton wool in a paper box, still, a tumbler inverted, if handy, or a large pickle bottle, will be the best.

Ether, Benzine or Creosote may be used in a similiar manner to Chloroform, but you ought to be able to do everything with the two first mentioned. A cabinet may look well or shabby according to the care exercised in killing. Don't try any experiments,and keep both Cyanide and Chloroform bottles corked tight. You will require to renew your Cyanide mixture after two months use.

Mounting Boards.—Of these you will require two sizes. They are used for putting insects into symmetrical shape, before storing them away in your cigar boxes. The large one consists of two pieces of soft wood 24 x $1\frac{1}{2}$ x $\frac{1}{4}$ inch, fastened one half inch from each other at one end, and one third inch at the other, by two end pieces screwed on; the space left between them to have a long piece of cork glued on. This provides space into which the body of the insect will go, and the pin passes through the cork. The wings are then extended on each board at the same angle, and kept *in situ* by a piece of stiff card fastened firmly down by two or three pins which must not perforate the wing. If the insects are large, put them into the oven for a few minutes or to a quick heat. The smaller board is similarly made, but the space left between the two pieces must be one third inch at one end, and less than one fourth at the other. The width need not be an inch, but the length the same. If you are industrious you can easily keep them filled. The large Dragon Flies, are best prepared on a piece of board, with a pin hole through it, first put the pin two thirds of the way through the body. Now turn the insect upside down and get the head of the pin into the pin hole in the board; stretch out carefully his delicate wings, and pin over them the card. By passing a long pin through the head, thorax and abdomen you can keep those dragon flies splendidly. Put them in the oven to dry afterwards. When mounting moths turn back the antennae on the wings if you would save them, when others who mount them in front, as butterflies, will have disfigured specimens, by having them broken.

[To be continued.]

[Dr. White will be pleased to hear from members on any subject connected with this Department. His address is 185 Carlton St., Toronto.]

SELECTED NOTES, &c.

The larva of the Calandra palmarium, the weevil found in the palm of the West Indies is considered quite a delicacy.

No entomologist should be without a note book, to record his observations. It is surprising how quickly one gets into the habit of "jotting down" his thoughts.

The egg from insecta differs from that of the vertebrata by having the yolk mass on the back, and not on the belly as in the chick set.

The fecundity of Insects is their chief protection against extermination. and if they were not a food for many other higher forms of life they would soon be masters of the world, man included.

The various stages of Insect life are the egg, larva, pupa and imago. They each have their distinctive history, and peculiarities.

It is wonderful the instinct which prompts an insect to deposit its eggs, on or near a substance which will be suitable food for the larva.

Eggs of insects will retain their vitality under greater extremes of cold than heat.

Some insects protect their eggs from rain by a secretion resembling varnish, and from cold by an excellant non-conductor like wool or down.

No doubt the reason why some insects, females, distribute their eggs over a large section of country, during flight, is to lessen the chances of being devoured by their ever alert foes.

According to Oswald Heer, insects comprise four-fifths of the whole animal kingdom, there being 190,000 known species of insects, and only 55,000 species of all other known animals.

Knowledge worth having, that is knowledge which will repay a thousand fold in pleasure, cannot be had without a certain amount of careful and painstaking study Nor will you experience the wonders and beauties of insect life without the preliminary labor; but no single pursuit will ever yield such a fund as will Entomology.

A paste of Termites, a species of ant, is the "bon bouche" of certain negro tribes in Africa.

Clover opens its flower when the bee alights on it, permits the extraction of honey, then closes lest the rain should wash the pollen away.—*Sir J. Lubbock.*

THE ENTOMOLOGICAL CLUB of the Pictou Academy is a small organization coordinate with several other clubs each devoted to some branch of Natural Science, the whole forming the "general science association" of the Academy. There have not been more than half a dozen very active members in the entomological club during the past season. But numbers is no object. The work of the club, as of all the other clubs, is conducted in this way. During the week, insects are being collected and examined by each member. At the regular weekly meeting of the club, the collections and notes of each are compared, and the books, &c., at the disposal of the club are consulted for the purpose of classification and information. In this way the members mutually stimulate each other to work, while the resources of the libraries of the Principal and of the Academy, such as it, are made available for direction and instruction. Minutes of the work done at each Meeting are carefully recorded by the Secretary. Each Club, as before mentioned, is a section of the General Science Association, and the minute book of each section is the property of the Principal, for preservation.

MEMBER.

Our needful knowledge, like our needful food,
Unhedged, lies open in life's common field,
And bids us welcome to the vital feast.

Young.

Chemistry.

III.

By J. F. Godfrey.

The elements which were known to the ancients retain the names given to them at the time of their discovery. Those discovered at later dates are named from some peculiar property they possess. Those which resemble each other have their terminations similar. All the recently discovered metals have the termination *um*.

An instance of similar endings may be found in the three elements, carbon, boron and silicon, which resemble each other in their properties.

Chemists denote the weight of an atom of any element by simply using the first letter or the first two letters of that element; for instance, C stands for one atom of carbon. Sometimes the Latin initial of an element is used to avoid confusion, for instance, silicon and silver both begin with Si, hence instead of using the English word for silver, Ag is assumed as the symbol. In some cases the first letter of an element is the same as that of several other elements, as Barium, Bismuth, Bonon and Bromine, all commencing with B. To obviate confusion the second letter of these is added Ba for Barium, Bi for Bismuth, Br for Bromine.

In forming compounds these symbols are placed in "justaposition" in the same manner as we would write the letters forming a word. Thus K Cl represents that one atom of potassium has been united to one atom of chlorine, forming potassic chloride. If more than one atom of an element be used in forming a compound this is shown by writing small figures below and to the right of the symbol. Thus the formula for ammonia is H_3 N, showing that three atoms of hydrogen are mixed with one atom of nitrogen.

In order to express the results of a chemical reaction, the chemist combines the formulæ of the molecules which take part in the reaction by means of the sign + these are placed on the left of the sign =, while on the right are placed the formulæ of the molecules which result from the chemical change. This expression is called A, chemical equation. The sign + indicates a mixture, the sign = indicates conversion into. For example, the equation H_3 N + H Cl = H_4 N Cl denotes that if we mix one molecule of hydric-chloride with one molecule of ammonia we shall form a single salt known as salammoniac.

The term *acid* was formerly used to denote a sour, corrosive substance, soluble in water, which turned blue litmus paper red. But at the present time the word acid has a more extended meaning, being applied to several substances which are insoluble in water, hence have no taste. The name acid is now applied to those substances which combine to form salts. Acids are named from the elements with which oxygen combines, and the ending of the word generally indicates the amount of oxygen present. For example, sulphurous acid denotes that a smaller quantity of oxygen is present than in sulphuric acid, the ending *ic* always indicating a larger amount of oxygen than the ending *ous*. Again, in chloric and chlorous acid the chloric acid contains the atoms of oxygen combined with one of hydrogen and one of chlorine, whereas in chlorous acid only two atoms of oxygen are combined with the one atom of hydrogen and one of chlorine. Some acids are formed without oxygen being present. These combine the names of both elements. Bases are substances which unite with acids to form salts. They are generally oxides of the metals.

In naming the salts formed by the union of an acid and a base, the termination *ic* of the acid is changed into *ate*, and *ous* into *ite*. Thus the salt formed by the union of sulphuric acid and some base is termed the sulphate of that base, and the union of sulphurious acid with a base is termed sulphite of that base.

Alkalas are compounds of hydrogen, oxygen and a metal, and have a soapy taste and feel. They neutralize the acids, restoring the color changed by them.

Mineralogy.

About eighty-eight different minerals used as gems occur in the United States Twelve of these are found no where else.

Diamonds are not mined in the U. S. A. One worth $5000 before cutting was found by a laborer employed in in grading the streets of Manchester opposite Richmond Va.

Sapphires, rubies and garnets, are principally found in New Mexico, Arizona and Southern Colorado.

Tourmalines taken from Mt. Mica Maine, are estimated at over $50,000.

Rock Crystal is gathered and cut in large quantities, total value per annum probably $40,000.

A nugget of gold from North Carolina has been exhibited weighing over four pounds containing nearly $1000 worth of gold.

Geography.

Lake LaRouge, which drains into the Churchill in the North-West, does not open into the Beaver River as formerly supposed.

Great Bear Lake has really but one outlet, the Bear Lake River flowing into the Mackenzie.

Lake Wallaston does not communicate with Lake Athabascœ.

The Lake Eskimo has but one outlet the "Natowdja," which flows directly into the Artic Ocean.

[The above corrections of geographical errors are made by the Rev. E. Petito, who has been travelling in North of the Continent.]

The Indians of Athabasca and Mackenzie Districts, chiefly Chipewyans and Crees, barely reach six thousand.

Mr. Stanley expresses increased surprise at the density of the population in the equatorial parts of the Congo basin, and estimates the inhabitants of that basin at forty-five millions.

The River Indus in India for a part of its course, below Bowauji in Gilgit, flows in a narrow gorge 17,000 feet deep. The bed of the river at this point is 3,000 feet above the level of the ocean.

According to recent reports the population of Sierra Leone is 60,500, nearly all blacks. The soil is poor, and the importance of the country consists in its geographical position and easy communication with the rich interior region.

Correspondence.

A subscriber interested in ornithology and taxidermy, referring to directions for skinning birds, as given in October SCIENTIST, asks if there is not some good substitute for arsenic in the preservation of birds' skins. As arsenic is a deadly poison, the discovery of a satisfactory substitue would remove from the practice of this interesting art, especially by amateurs, a strong objection. We have used arsenic freely in the limited amount of work that we have done in this department, and never experienced any evil effects. Still the objection remains, and one would be able to literally breath more freely if a substitute, free from danger, could be used. Perhaps some of our readers may be able to furnish the desired information.

THE GEYSERS OF CALIFORNIA.

The geysers were discovered in 1847 by a white mountaineer, who, with a small party, was bear-hunting in the vicinity. After a day's hunt he got separated from his party, and thought himself on the right trail to their camping ground; therefore he spurred his horse over the hill toward the geysers, until he saw what he took to be distant smoke With a feeling of curiosity and surprise at finding a human habitation in that lonely place, he hastened onward until he heard the roaring, hissing, and bubbling noises of the canon, and then in great fright he returned to his party to tell them that he had discovered the literal abode of the "Evil One"

The geysers are situated about one hundred miles from San Francisco, and may be reached in a few hours' travel by rail and stage. As sulphur and other minerals injure the wearing apparel, it is necessary in visiting this strange place to leave good shoes and suits behind, so that no thought need be bestowed upon the care of clothes.

The stage road winds up the mountains for 3,000 feet, where it overlooks the lovely valley below, and the down grade into "Pluto's Canon" is narrow with abrupt turns, where you may look down hundreds of feet; but accidents are not frequent, and the decent is quickly made, by four or six horses, to the "Geyser Hotel."

As you near the canon, you almost imagine from the noise, that you are entering a manufacturing town, or are near some harbor where the puff of steamboats greets the ear This noise is caused mostly by the "Steamboat Geyser," that keeps up incessantly a terrific sound, repeating its noise like Longfellow's "Old Clock on the Stairs:"

"Forever—never!
Never—forever!"

The "Witch's Caldron" boils so furiously that visitors do not care to go too near, for fear of being spattered with the hot liquid, which is pitchy black.

A feeling of insecurity oppresses you as you walk down the canon, now jumping over an ice cold spring, nd close by you leap over a stream of boiling water, and the crust all around seems just ready to break through and let you into some fiery furnace. You query whether it is not possible for the whole canon to blow up; if so, where would you land?

There is steam coming from your right, steam from the left, and the different odors, and sounds of hissing, puffing and bubbling, are quite exciting Steam comes from every little fissure, and on the "Mountain of Fire" near by, are more than one hundred apertures, each showing some remarkable peculiarity.

There are about 200 mineral springs in the valley, the names of some of them not being very classical. One is known as the "Devil's Grist Mill," another the "Calliope;" then there is the "Devil's Teakettle" and "Wash-Tubs." The "Indian Spring" is about a mile down Pluto's Creek; for generations, the Indians have used this spring on account of the benefit derived from its black, healing waters; the waters being hot, and blackened with sulphur.

The sulphur in the canon is like the liquids in a druggist's shop-window, of various colors; some being black, other kinds red, while much of it is yellow or white.

Some of the other minerals are iron, magnesia, soda, epsom salts, alum, indeed, it is a "druggist's paradise," and when you visit California, be sure and visit the geysers, and view one of Nature's grandest work-shops.—*Portland Transcript.*

THE ORIGIN OF THE POTATO.

The potato, originally a South American plant, was introduced to Virginia by Sir John Harvey in 1629, though it was unknown in some counties of England a hundred and fifty years later. In Pennsylvania, potatoes are mentioned very soon after the advent of the Quakers; they were not among New York products in 1695, but in 1775, we are told of eleven thousand bushels grown on one sixteen-acre patch in this province. Potatoes were served, perhaps as an exotic rarity, at a Harvard installation dinner in 1707; but the plant was only brought into culture in New England at the arrival of the Presbyterian immigrants from Ireland in 1718. Five bushels were accounted a large crop of potatoes for a Connecticut farmer; for it was held that, if a man ate them every day, he could not live beyond seven years.—*From "Husbandry in Colony Times," in the January Century.*

OPAQUE GLASS FOR COFFINS.

Dr. A. Mayer proposes a new mode of burial. For wooden coffins he would substitute glass ones, the glass thick and opaque, and hermetically closed with a silicated mastic as inalterable as the glass. So enclosed, bodies would give out neither gases nor liquids, and would have no injurious effect on public health. The body, moreover, might be preserved indefinitely from decomposition, by substitution of an antiputrid gaseous atmosphere, under suitable pressure. for the air contained in the coffin. For this purpose, two tubulures would be added, —one for entrance of the gas, the other for exit of the air. If carbonic acid were used, the difference of density of that gas and air would render the operation very easy. This mode of preservation, it is claimed, would present all the advantages of embalming, without mutilation or great expense. Glass coffins would allow of deferring burial, as is sometimes desirable. In the case of death during voyage, the body need not be consigned to the sea, but could be kept till arrival.—*Journal of Chemistry.*

A WESTERN ELDORADO.

RICH MINERAL DISCOVERIES IN IDAHO—GOLD AND SILVER IN LARGE QUANTITIES.

There is a great excitement throughout Western Montana over rich mineral discoveries in Cœur Dalene Mountains. Prospectors who have returned state that no mines have ever been discovered in the history of the Western States and Territories equal in richness and volume to the newly discovered fields. The minerals consist of silver, tillure, and free-milling gold. A hundred dollars per man per day is being taken out of the rim rock of gulches, while in the gulches $25 to $30 per man per day is panned out. The streams are in the northern part of Idaho, near Eagle City, forty miles from Bozeman on the Northern Pacific Railway. There are now about five hundred people in the camp.—*Can. Mining Review.*

CHINESE COINS IN BRITISH COLUMBIA.

In the summer of 1882 a miner found on De Foe (Deorse?) Creek, Cassiar District, British Columbia, thirty Chinese coins in the auriferous sands twenty-five feet below the surface. They appeared to have been strung, but on taking them up the

miner let them drop apart. The earth above and around them was as compact as any in the neighborhood. One of these coins I examined at the store of Chu Chong, in Victoria. Neither in metal nor matchings did it resemble the modern coins, but in its figures looked more like an Aztec calender. So far as I can make out the markings this is a Chinese chronological cycle of sixty years, invented by the Emperor Huungti, 2637 B. C., and circulated in this form to make his people remember it.—*James Deans in American Naturalist.*

GEOLOGICAL SURVEY OF NEW JERSEY.

The first survey of New Jersey was ordered by the Legislature of 1835. and was made by Prof. H nry D. Rogers. The results of this survey were published in a report of progress in 1836, and in a final report in 1840. In 1854 a second survey was ordered, and was carried on for three years under the superintendence of Dr. William Kitchell. In 1864 the survey was resumed, and has been continued till the present time under the charge of Dr. Geo. H. Cook, assisted by Prof. John C. Mock In 1868 a survey of the State by Prof. Cook was issued in a handsome octavo volume of 900 pages; and each year an elaborate report of progress has been published, with maps illustrating the geological features of the country and its mineral resources. It is safe to say that these reports, embodying the results of the labors of the gentlemen employed in the survey, have done more than any other half dozen agencies combined in developing the mineral wealth of the State, and have repaid one hundred fold the outlay required in carrying on the survey. The reports of Prof. Cook on New Jersey metals, fire clays, iron and zinc mining, drainage and water supply are models of their kind, and have given their author a front rank among the most learned and most practical geologists of the day. New Jersey is very proud of him, and gratefully acknowledges the immense debt she owes him for his services in her behalf.

Prof. Britton, of the School of Mines in New York City, has been engaged for two or three years in preparing a catalogue of the plants of New Jersey. Several hundred amateurs are cooperating with him in the work, and it is believed that the list, when published, will be exhaustive. Prof. Britton is also employed in collecting for description specimens of the fossil plants of the State. Prof. J. S. Newberry is at work on a monograph of the fossil fishes and plants of the New Jersey Triassic Sandstone. Prof. R. R. Whitefield, of the American Museum of Natural History in New York City, is engagad in preparing for the press a description of the invertebrate fossils of the cretaceous formation of New Jersey. The two gentlemen last mentioned are very desirous of making their work as complete as possible; and since new material is constantly presenting itself, and since the appropriation of the Legislature is ample for three years longer, the results of their labor will not be given to the public just yet.

In the course of two or three years Prof. Cook hopes to make another full report on the Geology of the State. after which time it is expected that the survey will be closed, or at least reduced in expense to a bureau for recording progress in material development and furnishing information in regard to resources.

REV. A. DEAN.

THE RECENT REMARKABLE TWILIGHTS.

It is now practically certain that the brilliant phenomena, which during the past few months have been so often seen at sunrise and sunset, cannot be due to merely local causes, nor to any ordinary meterological conditions It is true, of course, that now and then, after the clearing of a storm, sunsets quite as gorgeous have often occured before; and if we had to do only with scattered instances, it might be admitted that no new hypothesis is needed. But when we are dealing, as now, with such appearances, simultaneous, and extending over the whole earth's surface, the affair is different.

We have accounts from every direction of a series of most impressive atmospheric phenomena, which began with the closing days of August in the islands of the Indian Ocean, and on the eastern coast of Africa, and since then have covered the world. At first, and near the Equator, there was a dense haze, which made the sun no brighter than the moon, and tinged its light with vivid hues of green and blue. Later, in October, the equatorial stations had the same crimson dawns and sunsets, which in November and December reached the temperate zones, and still continue in the United States and Europe. All the observations go to show that the upper regions of the atmosphere, at an elevation between twenty and fifty miles, are now filled with a fine haze or cloud, which consists neither of ice-crystals nor water-drops (as is proved by the testimony of the spectroscope and polariscope,) but probably of minute solid particles, possibly mingled with some gas, lighter than common cloud, originating near the Equator, and carried at first by the upper equatorial current. would be gradually diffused and distributed north and south over the earth by the return trade-winds; and if the dust were fine enough, it might be many months before it would finally settle down and clear the air above the region of the clouds.

Now where could and did such a cloud originate? I believe (and this is the independant conclusion of many men of science) that it consists simply of the ashes and other matter ejected during the great volcanic eruption of Krakatow, in the Straits of Sunda. (Latitudo 6° S.) This eruption, probably the most tremendous in the annals of history, reached its crisis on August 27th and 28th, and an island some 4000 feet in height, and seven or eight miles in diameter. was literally blown into the air, and vanished. Over Java and Sumatra day became night. On the 28th and 29th the cloud reached Mauritius (which, however, lay near its edge.) Mr. Meldrum observed the characteristic sunset phenomena and at once surmised their volcanic origin, because a notable series of earthquake-waves had arrived a few hours before. On September first an English observer on the Gold Coast of Africa (in the Gulf of Guinea) reported that the sun was green for several hours, and so pale as to be mistaken for the moon. The next day in the West Indies and over northern Brazil and Venezuela, the same green or bluish sun appeared. No report has yet been received to determine the westward progress of the cloud across the Pacific, but probably the circuit of the earth was made within a week or ten days. At any rate, in India and Ceylon they were confounded by a bright green sun at sunrise and sunset for a week or more from September 8th to September 15th —an effect probably produced by the cloud on its first return, much widened and rarified by the deposition of its coarser particles. It need hardly be

added that a cloud which would cause the sun, seen *through* it, to look green, would itself be likely to appear red by reflected light. When at last the cloud had so widened in its travels as to spread itself over our latitudes, its density had become so reduced that its effects on *transmitted* light were hardly noticeable, though in a few cases observers in this country and England saw the *moon*-light tinged with green

It would not be proper to discuss the matter without an illusion to another theory proposed and held by some astronomers of authority: that this upper-air cloud is of *meteoric* origin. I have no time to discuss it here, further than to say that in the presence of a known and sufficient cause it is hardly worth while to have recourse to one that is purely hypothetical. We have had no known meteoric encounter lately, nor was any known meteoric encounter ever follwed by similar phenomena.—*C. A. Young in the Critic.*

CHINESE SCIENCE.

From ancient times the Chinese have taken note of the natural phenomena. Their report of solar eclipse is, perhaps, the most ancient and accurate in the world They have more or less elaborate works on astronomy, mathematics, botany, zoology, mineralogy, physiology and many other sciences. Yet there is scarcely any true science in them Classification, even in regard to plants and animals, there is none. Mineralogy is mainly a description of curious stones. Nor is there any progress, for the more ancient works are generally the best, and as a consequence the Chinese to day are as their fathers were thousands of years ago. The superstitions respecting natural phenomona, which are living, active truths to day for all classes in China, remind us rather of men in his state of barbarism than of the ancient culture and civilization of the Middle kingdom. The sun and moon are to the Chinese, as they were to primitive man, living things, gods to be worshipped. The sun and moon are to the Chinese, as they were to primitive man. living things, gods to be worshipped. The stars in their courses, powerfully influence, if they do not absolutely determine, all human events. In them the wise may read as in a book the destiny of man and the fate of empires. Their combinations make lucky and unlucky days, and we shall do well to note carefully their signs and silent warnings. Comets are the precursors of famine, pestilence and war—prognosticators of the wreck of empires and the fall of kings. Eclipses are the periodic efforts of the dragon fiend to destroy the lights of heaven, and every notice of an approaching eclipse sent by the imperial astronomer to the Provinces is accompanied by a government order to employ the usual methods of gong-beating and so forth in order to rescue the threatened luminary. Again, thunder is the roar of the anger of heaven, and to be smitten by a thunderbolt is to be marked as a thing accursed. Wind is born in the heart of great mountains, whence it issues at the command of the wind god. Most districts have their wind mountains. That of Lung Shan, in the northern Province of Chihili, is the most remarkable. It has a cave at each of its four sides. The spring wind issues from the cave on the Eastern side, the summer wind from the Southern, and so for the others. Wind eddies or whirlwinds are raised by the hedgehog in his rapid passage from one place to another, the dust serving to screen him from the vulgar gaze. Rain is produced by the dragon god, who carries up vast quantities of water from the lakes and rivers in his capacious

jaws and pours it down in showers over the earth. Every mountain has its spirit or genius, every valley its nymph, every spring its naiad. Hence mountains and rivers, old trees and curious rocks, become objects of wor ship.—*Nature.*

Beautiful are the heralds
That stand at Nature's door,
Crying, "O traveller, enter in,
And taste the Master's store!"
Littlewood.

Literary Notes.

The current issue of the *Princeton Review* is at hand, and proves to be of unusual interest. The leading article is by Julian Hawthorne on "Agnosticism in American Fiction," in which it is stated that the influence of agnosticism has appeared on the surface of a great deal of recent art work, and that artists and novelists have begun to doubt whether the old conceptions of beauty are not fanciful, and the tendency of this is seen in a greater confinement hy novelists to matters of fact. Referring to the inspiration drawn from Tourgeneff by Howells and James and its effect upon their work, the writer says that such productions as these authors have given us are not the great American Novel, because they take life and humanity not in their loftier but in their lesser manifestations.

"On the Education of Statesmen" is an interesting paper by Prof. Henry C. Adams, of Cornell University.

A bright, spicy paper, by R. R. Bowker, is "The College of To-day," which the explanatory note that precedes says is "a supposed address before citizens of the city of Hygeia proposing to found a college. This paper gives some advanced views on education in general and college management and curriculums in particular.

Canon George Rawlinson, of the University of Oxford, contributes a very readable paper on "The Morrow of the Gladstone Administration," in which after paying due hemage to Mr. Gladstone for the valuable services rendered by him to England, he says that his retirement is imminent, and regards it as quite inevitable that the Marquis of Hartington will be chosen to succeed him ns Premier and leader of the Conservative party in Parliament. Other articles in the number are "A Study of the Mind's Chambers of Imagery," by President McCosh and Prof. Henry F. Osborn, of Princeton College, and "The Railway Problem," by C. Stuart Patterson.

Lippincott's Magazine for January contains an amount of varied and entertaining reading, which gives the best assurance of the good things to be expected during the coming year. It opens with a description of the new Public Buildings of Philadelphia, written with marked ability, and copiously illustrated. "Notes of Conversations with Emerson," by Pendleton King, bring up very vividly the figure of the great New England thinker in the simplicity of his Concord home. "Matthew Arnold in America," by L. J. Swinburne, is an appreciative criticism, treating mainly of those points in Mr. Arnold's teachings which have a special application to American social life, "Hawaii Ponoi," by Belle Osburne, is an amusing account of the recent coronation of King Kalakaua, with many capital illustrations from sketches by the writer. "Undergraduate Life at Oxford," by Norman Pearson, an account of the great flour mills of Minneapolis, by F. G. Curtis, and the first of a series of papers on "Healthy Homes," by Felix L. Oswald, are all interesting and instructive articles. The opening chapters of "Sebia's Tangled Web," a short serial story, by Lizzie W. Champney, "Christmas Eve at Tuckeyho," by Sherwood Bonner, and "Whither Curiosity Led," by Charles Dunning, constitute the fiction in this number and will be found very attractive. There is the usual variety of short papers in the "Gossip," and the notices of new publications, principally holiday books, are numerous and discriminative.

The *North American Review* for January presents a table of contents possessing in the highest degree the character of contemporary human interest. First, the opposite sides of the question of "Ecclesiastical Control in Utah" are set forth by two representative men, whose competence for the performance of the task undertaken by them respectively admits of no doubt, viz.: President John Taylor, the official head of the Mormon Church, and the Hon. Eli H. Murray, Governor of the Territory of Utah. Senator John I. Mitchell writes of the "Tribulations

of the American Dollar." In an article entitled "Theological Re-adjustments," the Rev. Dr. J. H. Rylance insists upon the necessity of eliminating from the formularies of belief and from the current teachings of the churches, whether in the pulpit or Sunday School, all doctrines and all statements of supposed facts which have been discredited by the advance of exegetical scholarship, and by the progress of natural science. Senator Henry W. Blair, taking for his theme 'Alcohol in Politics," declares his belief that another irrepressible conflict is at hand. and advocates the submission to the people of an amendment to the United States Constitution prohibiting the manufacture, sale and importation of intoxicating liquors. No one who read in the December *Review* the first half of "The Day of Judgment," Gail Hamilton's incisive review of the domestic life of Thomas Carlyle, will forego the pleasure of perusing the latter half in the current number. "Evils Incident to Immigration," by Edward Self, is a forcible statement of the mischiefs wrought by the importation into our social and political life of an enormous annual contingent from the lowest stratum of the population of Europe. Finally, the subject of "Bribery by Railway Passes" is discussed by Charles Aldrich and Judge M. N. Hubbard. Published at 30 Layfayette Place, New York, and for sale by booksellers generally.

The *Fountain* is a new and promising magazine, designed especially to furnish supplemental reading for schools. Every teacher must feel the necessity for something of this sort, and should send for specimen copy. See advertisement.

Buds and Blossoms, a large illustrated magazine full of good, wholesome Christian literature. Interesting stories, poetry and selections make this a valuable journal for home reading. Edited by Rev. J. F. Avery, Halifax, N. S 75 cents a year.

The Sanitarian comes to hand much improved in form, which is that of an octavo monthly of 92 pages, instead of a quarto weekly as formerly We think that we see also an improvement in the already good quality of its contents. Among other valuable articles is one on "School Hygiene," in which the author points out certain evils in the prevailing arrangement of school-rooms and in the school training of children. New York: A. M. Bell, A. M. Editor. $4.00 a year.

For the young folks we know of no magazine so interesting as *St. Nicholas*, and even the older ones are pleased with it. Publlshed by *The Century Co.*, New York.

The *Bulletin* of the Torrey Botanical Club for October and November is especially valuable for the "Notes on the American Species of Tolypella," with *six* plates by T. F. Adams.

We have received the *American Naturalist* for January. This is the first No. of Volume XVII. The leading articles are as usual good. A very striking one is that of S. V. Clevenger, M.D., on the "Disadvantage of the Upright Position." His arguments are suggested by the position of the valves in the venous system of man. Then there are the following papers: "The Mammalian Fauna of the Australian Desert," by Edward B. Sawyer; "Observations on the Pulsating Organs in the Legs of Certain Hemiptera," by Wm. A. Lucy; "The Epiglottis in the Bull Snake," by Chas. White: "The Carolina Wren," by Chas. C. Abbott. and the "Batrachia of the Permian Period of North America," by E. D. Cope. The review of recent literature and the Editor's Table are very interesting, and the General Notes on the various departmenrs of natural science are a little cyclopedia of novelties. McCalla & Stavely, Publishers, Nos. 237-9 Dock Street, Philadelphia.

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THE CENTURY!

PROGRAMME FOR 1883-84.

The programme for the fourteenth year of this magazine, and the third under the new name, is if anything more interesting and popular than ever. With every season THE CENTURY shows a decided gain in circulation. The new volume begins with November, and, when possible, subscriptions should begin with that issue. The following are some of the features of the coming year :—

A NEW NOVEL BY GEORGE W. CABLE, author of "Old Creole Days," etc., entitled "Dr. Sevier," a story of New Orleans, life, the time being the eve of the late Civil War.

"LIFE IN THE THIRTEEN COLONIES," by EDWARD EGGLESTON, separate illustrated papers on subjects connected with the early history of this country.

THREE STORIES BY HENRY JAMES, of varying lengths, to appear through the year.

THE NEW ASTRONOMY, untechnical articles, by Prof. S. P. LANGLEY, describing the most interesting of recent discoveries in the sun and stars.

A NOVELETTE BY H. H. BOYESEN, author of "Gunnar," etc A vivid and sparkling story.

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A NOVELETTE BY ROBERT GRANT, author of "Confessions of a Frivolous Girl," etc., entitled "An Average Man"—a story of New York.

THE BREAD-WINNERS, one of the most remarkable novels of the day, to be completed in January.

CHRISTIANITY AND WEALTH, with other essays, by the author of "The Christian League of Connecticut," etc., on the application of Christian morals to the present phases of modern life.

COASTING ABOUT THE GULF OF ST. LAWRENCE, a series of entertaining articles, profusely illustrated.

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"GARFIELD IN ENGLAND," extracts from his private journal kept during a trip to Europe in 1867.

"THE SILVERADO SQUATTERS," by ROBERT LOUIS STEVENSON, author of "New Arabian Nights."

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