For the Scientific American
Evaporation and Condensation.

It is well known that although evaporation is caused by heat, yet in its turn, it has the property of producing cold. Every engineer knows that when steam has been confined until it has acquired a very high pressure, as in the case of high pressure engines, upon its liberation, it may be handled with impunity.—The rapid evaporation of ether at the temperature of our atmosphere produces cold, and the sprinkling of an animal in the sunshine continuously with this fluid, will freeze it to death. During the meridian heat of summer and while the earth is almost parched, the radiation of heat and of moisture from every blade of grass, produces a coolness and freshness that is sweet to the traveller in comparison with the burning desert, where no evaporation from pool or shrub is known. And when the sun sets behinds the western mountains, every blade of glass and every flower becomes a condenser on which are deposited the spangled dew drops which gem the green fields with a radiance more fair than if they were crowned with diamonds or decked with pearls.

The amount of evaporation, is greatest in hot climates, and less as we approach towards the poles. No visible vapor is considered to ascend above the congelation height, which in the tropics, is never above 28,000 feet, and in this State 10,000 feet. Vapor is only water combined with a certain quantity of caloric, and exists in the atmosphere as an elastic and invisible fluid like the air itself, and by some has been supposed to be better adapted for the propulsion of machinery in that state along with air, than to heat water to raise steam. I have heard the assertion made, "that 50° of heat applied to heat the air for mechanical propulsion, will generate a fluid as elastic as steam under the pressure of two atmospheres." This assertion still remains to be satisfactorily proven. More water is evaporated from land covered with trees and grain fields than from the surface of rivers and lakes. It is calculated that there annually falls upon the land, 30,960 cubic miles only, leaving 17,280 for evaporation, an enormous quantity certainly, and shows a wise and beneficent design in the Great Creator.

Evaporation in all cases conveys electricicity into the atmosphere, and when steam is condensed into water, the air becomes negatively electric. The laws of evaporation and condensation when combined with caloric, perform a most important part in the operations of art. Without the cooling property exerted in the evaporation of fluids, in vain would be our efforts to drive the locomotive over the earth with the speed of the eagle's wing. Without the cooling property developed in evaporation, the steam boiler would soon become red hot and would explode in fragments under the pressure, but the absorbing capacity of water for caloric, which combines and flies off with it in the steam, robs the furnace of its energy to destroy, and imparts a power to man to tame it as he would the fiery courser. This very quality of evaporation—this property of water and caloric, does not belong to carburetted hydrogen combined with the atmosphere, nor to gunpowder, nor any other of the gases, whether produced from combustion or any other project that ever has been suggested—hence such schemes have obstacles, fatal obstacles to overcome in their employment and application to purposes of general usefulness. Many a gas and powder propeller inventor would have saved both time and money, had he spent two weeks in close study of the properties of steam and the principles of evaporation.

It is very singular that whenever a body changes its state chemically, (so far as we are yet acquainted) that it either combines, or separates from caloric—the dissolution of one body assisting in the formation of another.—Water becomes steam by absorbing heat, and steam becomes water by parting with its heat. From a fluid it becomes, by the quantity of caloric absorbed, an explosive gas, while on the other hand by the quantity of heat thrown off, it becomes a frozen solid. In all this we perceive a beautiful and harmonious arrangement of natural law. The meanest flower "that wastes its fragrance on the desert air," performs not only an important part in the vegetable, but to the animal economy. Every shrub that grows by the side of the workshop is a curious workshop within itself. The retort of the alchymist is no more correct than the retort comprised within an humble blade of grass. "He who studies nature is well adapted to study art."

R. Bartholomew.

For the Scientific American,
The Importance of one Gas.

Without oxygen animal life would cease to exist. It is the principal supporter of combustion and therefore without it we neither could light a candle nor kindle a fire. The gas is invisible and inodorous, and yet for all this, it is of the most importance and by its various uses, it fulfills the divine allusion to the simple laws of nature "he has chosen the weak things of this world to confound the mighty."

It exists in larger quantities than any other body; it constitutes more than a fifth of the atmosphere by which this earth is surrounded—eight-ninths of all the water which exists upon its surface, and besides existing in larger quantities in all animal and vegetable substances, it forms at least a third part of the total weight of the globe.

The air contains about 21 parts of oxygen in 100; if this proportion of oxygen is lessened to 17, our lamps go out, and combustion of every kind ceases; and at 15 parts in a hundred animal life is destroyed. These facts show us how nicely adjusted are the elements of nature, and that those substances which now are arranged by the hand of Providence, to conduce to our comfort and the support of life, would in other proportions become our worst enemies.

For the Scientific American.
Nova Scotia Mines.

Messrs. Editors:—I notice in a late number of your paper an article upon the iron mines of Nova Scotia. As I had the pleasure during the past autumn of visiting the region in which the mines spoken of occur, for the purpose of examining some mining localities, I can bear full testimony to the rich metaliferous character of that part of the Province.—This is not only true in regard to iron and coal but it is also rich in other natural products.—Some of these, such as gypsum, the oxides of manganese, &c., have been rendered available; others no less valuable, still lie dormant.

Public attention is now being called to those rich deposits. While it is true that the odious monopoly of the Mining Association is a great, and in many locations, an effectual bar to mining enterprise; still there are many mineral tracts upon which this Association has no claim; the minerals not having been reserved by the crown when the land was granted; and there are many grants in which only part of the minerals were reserved. And though there is much mineral wealth in the United States yet undeveloped, I cannot but look upon the region round the Bay of Fundy as possessing from its favorable climate, ready means of access and communication and its other facilities for business, peculiar advantages and inducements for mining enterprise.

I visited, among other localities, that of the Londonderry Mining Company mentioned in the article above referred to, and a few additional particulars may not be uninteresting to your readers.

These ores occur in what is called Folly Mountain, which is a portion of the Cobequid chain of hills running parallel to and about 6 miles distant from, the Cobequid Bay. The rock, or "country," as miners term it, is grey quartz, with dark colored slate and greenstone, the whole either vertical with East and West strike or dip at right angles to the Southward. The ores are the specular or glance ore, ochrey red ore, carbonate of iron, brown hematite, and and ankerite. These all form a venigenous deposit coinciding in situation with the rock strata The specular ore often occurs in a state of perfect purity, or mixed with a very small proportion only of silicious matter, and is frequently found in the fissures of the ankerite and combined with it. The ochrey red ore is often found pure in masses of large quantity, and also accompanies and is mixed with the ankerite. This latter mineral occurs in vast abundance. It has a large grained crystaline structure, of reddish and yellowish colors, and is usually more or less mixed with the specular ore. The reddish variety is colored by the peroxide of iron. The richness of these ores according to the analyses of the celebrated Dr. Ure of London, and J. W. Dawson, Esq. of Pictou, Nova Scotia, is as follows:

Specular or Glance Ore:—This is a pure peroxide of iron, yielding from 97 to 99 parts of the peroxide in 100. This would give from 65 to 70 parts of metallic iron in 100 of ore.

Ochrey Red Ore:—This gave 97 per cent of peroxide of iron. As an ore of iron, it is therefore but little if any inferior to the Micaceous variety.

Ankerite:—A pure specimen of this gave in 100 parts:—

Carbonate of Iron,	23.2
Carbonate of Lime,	54.0
Carbonate of Magnesia,	22 0
Silicious Sand	00.3
	99.5

Carbonate of Iron:—100 parts of this gave:

Protoxide of Iron,	40.5
Carbonic Acid,	24.7
Silica with a very little alumina and a trace merely of lime,	25.0
Moisture or water,	9.8
	100.0

Hematite:—100 parts gave:

Peroxide of Iron,	85.8
Silica,	8 2
Moisture,	6.0
	100.0

At the Styrian Mines where ankerite occurs in quantity and of a composition very nearly resembling the above; it is highly prized both as an ore and a flux, and it can scarcely be doubted that the varieties found in this location will prove of much value for similar purposes.

In regard to these ores Dr. Ure remark:—"Were this (the specular) ore deoxidized by being calcined in a pulverulent state mixed with ground wood charcoal in close earthen retorts, like those now used in some gas works; it would become reduced to fine soft iron, which being worked in the puddling furnace would afford an excellent malleable iron without the cost and the labor of a blast furnace. In this point of view an ore of this remarkable purity will yield either wrought iron or steel at a remarkably cheap rate." Of the carbonate of iron he says: "This is analagous to the celebrated *Black Band* of Scotland by which so many great fortunes have recently been made, and is the Iron Stone so profitably smelted at the Clyde Iron works from the Cross Basket and other deposits in that neighborhood. It affords the best cast iron for hollow wares, being very pleasant and giving a very smooth surface to castings, like the Carron pots. The humatite is analagous to the fine kidney ore of Cumberland, which produces the only good English steel iron."—And in conclusion he says: "The ores are unexceptionably good and easily smelted.—Charcoal iron made from these ores will rival the best marks of Swedish iron."

From the above. it seems that the quality of these ores cannot be doubted. The above analyses do not show, neither have I been able to discover any sulphur, chrome or other injurious ingredients. This also seems to be confirmed by the statements of Mr. Mushatt, as published in the article referred to.

At the time I visited the locality but little had been done in prospecting, but as far as the lode had been opened, the quantity appears inexhaustible.

Another item in the perspective value of these mines, is, that the contemplated Halifax and Quebec Railroad will cross this chain of hills very near this locality. Should this road ever be constructed it will, according to the Report of the Engineers, run within less than a mile of these mines.

These facts, together with the favorable situation of the locality, the lode cropping out on the top of a hill 200 or 300 feet in height, and presenting a favorable opportunity for drainage by duct levels or cross cuts; a good shipping point of easy access about 6 miles distant, with roads and other facilities for business already in existence; abundance of wood easily and cheaply obtained; and a section of the carboniferous rocks extending from the foot of the hill to the Bay, in which strata of bituminous shale and coal occur, and from which coal can probably be obtained should it be wanted hereafter; these all combined present inducements for mining enterprise in the iron business equalled by few if any other locations in this or any other country.

I did not notice any traces of lead or copper ores as mentioned by Mr. Mushat, but these ores may hereafter be found. The limited explorations at the time of my visit would not warrant the assertion that they do not exist there. This location is but one of many that now promise good returns, and much mineral wealth will yet be discovered that is not under the Crown or the Mining Association And I think with you that public attention should be called to this region. Its contiguity to our own markets; the facilities for communication and transportation, and the connection which now exists between different parts of this Continent, and which is constantly growing stronger, render this subject worthy of notice. Yours, &c. B.

Northampton, Mass. July 22, 1848.

Visit to Lord Rosse's Telescope.

Dr. Robinson lately gave an interesting account, to the Royal Dublin Academy, of the present condition of Lord Rosse's telescope The figure of the speculum not being quite perfect, it was resolved to repeat the polishing process, which requires to be performed at a temperatnre of 55°, whilst the artificial heat, by means of which this has to be effected, in winter occasions a dryness in the air in consequence of which the polishing material will not remain on the speculum. This difficulty was ingeniously obviated by a jet of steam. The result was admirable. The telescope is to receive a removal in right ascension from the ground, connected with clock-work; an eye-piece of large field, but capable of being replaced by the usual one in an instant, to obviate the difficulty of finding objects; and a peculiar micrometer of parallel glass with a position circle attached. Unfavorable weather had prevented much being done with the telescope.—But in one good night Dr. Robinson observed in the moon the large flat bottom of the crater covered with fragments, and became satisfied that one of the bright stripes so often discussed had no visible elevation above the general surface.—In the belts of Jupiter, streaks like those of Pyrrhus' cloud were seen, evidently through a considerable and imperfectly transparent atmosphere. The nebula of Orion, even with the imperfect mirror and in bad nights, was seen to be composed of stars in that part which presents the strange flocculent appearance described by Sir John Herschel. But in addition to the two stars of the trapezium discovered by the telescopes of Dorpat and Kensington, the six feet showed other two after the first glance at its polish was completed. The planetary nebula situated in the splendid cluster Messier was seen to be a disc of small stars uniformly distributed and surrounded by the larger. The most remarkable nebular arrangement which the instrument has revealed is that where the stars are grouped in spirals, one of which Lord Rosse described in 1845. Dr. Robinson has now discovered others—h. 604, seen by Herschel as a bicentral nebula—Messier 99, in which the centre is a cluster of stars—Messier 97 looking with the finding eye-piece like a figure of 8, but shown by the higher powers to be star spirals, related to two centres, appearing like stars with dark spaces around them. Struve, in computing the limit of the milky way, assumes it in its greatest extent "unfathomable by the telescope." Dr. Robinson is certain that its remotest stars are very far within the limit of the 6-feet, and very much larger than those of the nebula of Orion.

A Singular Plant.

A plant has recently been discovered in northern India, which, when chewed, actually destroys the power of the tongue to appreciate the taste of sugar. It is called the Indian plant, and the effect it produces remains about twenty-four hours. It is suggested that this may lead to some important philosophical discoveries in regard to the organ of taste.