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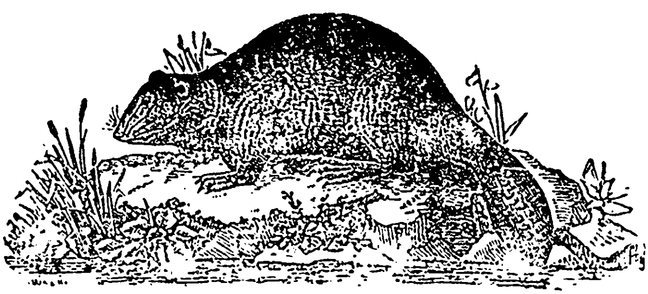

THE BEAVER (*Castor Canadensis*, Kuhl).

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NOTES ON CANADIAN BRYOLOGY.

By DR. N. C. KINDBERG, Linkoeping, Sweden.

(Communicated by John Macoun, M.A., F.L.S., F.R.S.C.)

ANDRÆA SPARSIFOLIA, Zett. *Var.* SUBLÆVIS, Kindb. (N. var.)

Leaves generally smooth, rarely faintly papillose, the perichetial ones subobtuse.

Near Cape Beale, Vancouver Island, May 9th, 1892. (J. M. Macoun.)

DICRANOWEISIA OBLIQUA, Kindb. (N. sp.)

Differs from *D. crispula*, principally in the capsule being asymmetric, curved, substrumose in a dry state; the perichetial leaves being acuminate, and the costa excurrent in all leaves.

On stones along Asulcan Creek, near the Glacier Hotel, Selkirk Mountains, B.C. August 8th, 1890. (Macoun.)

DICRANELLA POLARIS, Kindb. (N. sp.)

Tufts dusky green, not shining, fuscescent below. Stems 1-3 mm. high, erect and simple, leaves rigid, patent-erect, nearly straight, from the ovate-oblong base narrowed to the subulate, indistinctly two or three toothed, acumen; cells not papillose, the lower marginal narrow, the upper sub-oblong; costa broad, often two-thirds of the lower part below, faintly marked, filling the whole acumen; perichetial leaves larger, entire, broader at the base, with more numerous marginal cells. Capsule asymmetric suboval, finally subclavate, curved, smooth, short-necked, orange; lid with a long, oblique beak; peristome of 16 teeth, nearly entire, slightly cleft above, orange with paler tips; annulus not distinct; pedicel yellow, erect, 10-12 mm. long. Spores small, about 0.015 mm. Calyptra short, dimidiate.

Differs from *Dicranella cerviculata* in the structure of the peristome, the broader leaf costa, and the larger perichetial leaves; also from *D. heteromalla* in the smaller size, the rigid leaves, the broader costa and the not striate capsule.

St. Lawrence Island, Behring Sea, Aug. 15th, 1891. (J. M. Macoun.)

DICRANELLA CERVICULATULA, Kindb. (N. sp.)

Agrees with *D. cerviculat a*in its diœcious inflorescence, the strumose capsule and the yellow pedicel; differs in the leaves being gradually acuminate, the cells short quadrate, only the inner at the base rectangular, the costa narrow, well-defined, and not filling the acumen, only in the perichetial leaves distinctly excurrent. The tufts are very dense and compact, dark green, the leaves not spreading, the pedicel is short about 7-8 mm., the stem 5 mm.

On Digge's Island, Hudson Strait, August, 1884. (R. Bell.)

LEPTOTRICHUM (Ditrichum) TOMENTOSUM, Kindb. (N. sp.)

Tufts very compact and tomentose, 2-3 cm. high, the tips yellowish green, faintly glossy. Leaves small, entire, from the ovate-oblong base attenuate to the involute or canaliculate, scarcely longer or often shorter acumen, appressed in a dry state; costa occupying the half of the leaf-base, and the whole acumen; alar cells not distinct, the lower ones subrectangular, the upper shorter, suboval. Barren.

Probably allied to *Leptotrichum homomallum* or *Lepto. zonatum* Lev. The leaves are broader than in *L. homomallum*, and not so long-acuminate. It has also the habit of *Campylopus*, and some forms of *Dicranella heteromalla.*

St. Paul's Island, Behring Sea, July 3rd, 1892. (J. M. Macoun.)

RACOMITRIUM FASCICULARE, Brid. Var. HAPLOCLADON, Kindb. (N.var.)

Branches attenuate, acute, simple, or nearly without branchlets.

St. Paul's Island, Behring Sea, July 6th. 1892. (J. M. Macoun.)

MNIUM GLABRESCENS, Kindb. (N. sp)

Differs from *M. punctatum* in the stems being nearly glabrous, the leaves green, not nigrescent, faintly reflexed at the borders in a dry state, the upper leaves narrower, oblong or oblong-lanceolate, the cells smaller, more rotundate, the costa red only in the middle, (as in *M. stellare*) pale at the borders, the inner perichetial leaves ovate-oblong subobtuse, the pedicel sometimes 5-6 cm. long.

Sitka, and Port Etches, Alaska, 1891-92. (J. M. Macoun.)

Swamps, Queen Charlotte Islands, and Comox, Vancouver Island, 1878, 1885. (Dawson.) Near Victoria, and at Comox, Vancouver Island, 1875, 1887. (Macoun.)

LESKEA MOSERI, Kindb. (N. sp.)

Stems creeping, irregularly branching or pinnate. Leaves small, green, not glossy, from a short ovate, at the borders recurved, base, narrowed to a longer and filiform acumen, entire, indistinctly papillose; cells rotundate or quadrate; costa percurrent or excurrent Perechetial leaves narrowly ovate-oblong, obtusate, short-acuminate, serrate above, at least to the middle. Capsule erect, cylindric-lanceolate, with a small mouth; peristome pale; endostome as long as the teeth; cilia none; lid conic, short-apiculate; pedicel about 2 cm. long. Male flowers not found. Differs from *Leskea nervosa*, principally in the leaves being longer-acuminate, and the perichetial ones subobtuse; it differs also in the peristome.

Tay Forks, York Co., N.B., 1890. (J. Moser.)

ANOMODON PLATYPHYLLUS, Kindb. (N. sp.)

A. obtusifolius, Can. Musc., No. 256: Macoun Cat., Pt. VI, 171.

Stem irregularly divided or irregularly pinnate; branches thick; leaves large, pherifarious and crisped when dry, (as in the *Anomodon apiculatus* and *A. viticulosus*), undulate and entire at the borders, very broad, nearly ovate-oblong or from a little broader, cordate and strongly papillose, base slightly narrowed to the lingulate at apex rounded acumen; inner basal cells subhyaline, not well-defined. Perichetial leaves strongly papillose and subdentate at the base, and contracted to a narrow, lingulate acumen. Capsule much smaller than in *A. apiculatus*, oval-oblong; endostome rudimentary; lid short-conic, not rostellate; pedicel yellow, less than 1 cm. long. Diœcious.

Differs from all our other species in the broader leaves, from the nearly allied in the small capsule.

Apparently all my specimens of *A. obtusifolius* are of this species. (Macoun.)

PSEUDOLESKEA ATRICHA, Kindb. (N. sp.)

P. atrovirens Var. *atricha*, Kindb., Macoun, Cat., Pt. VII, 180.

Tufts brownish or olivaceous, with green tips, loosely cohering, without rhizoids. Leaves distinctly papillose, ovate-oblong, short-acuminate, serrulate at the acumen , cells elongate, conflated, irregularly sinuous. Capsules not found.

On rocks along the Eagle River, just below the little bridge at Griffin Lake, B.C., August 11th, 1889. (Macoun.)

THUIDIUM (Elodium) PSEUDO-ABIETINUM, Kindb. (N. sp.)

Stems imbricate, densely tufted, creeping, densely brown-tomentose, simply pinnate ; branches distant, short. Stem-leaves faintly papillose, broad-ovate, short-acuminate ; cells generally elongate, the middle ones oval-oblong ; branch-leaves ovate-oval subobtuse, distinctly denticulate and papillose on both sides, opaque. Capsule curved, lid not found. Monœcious. Habit of *Thuidium* (Elodium) *paludosum*.

In a swamp a little west of Britannia Station, and south of the Canadian Pacific Railway, six miles west of Ottawa, September 11th, 1890. (Macoun.)

THUIDIUM ABIETINUM, *PACHYCLADON, Kindb. (N. subsp.)

Differs in the branches being crowded, the stem leaves gradually long acuminate, ovate-lanceolate, the apical cells narrow, the basal orange. Capsules not found. Resembling in habit *Thuidium Blandowii.*

On rocks, summit of Tunnel Mountain, at Banff, Rocky Mountains, Alt. 5,500 feet, June 29th, 1891. (Macoun.)

ISOTHECIUM MYOSUROIDES, *BREVINERVE, Kind.

I. acuticuspis, Mitt.

Differs in the stem leaves being nearly entire, long acuminate, with a short and sometimes forked or indistinct costa. Capsules not found. Diœcious.

New Harbor and Speedwell Bay, Newfoundland, Dec. 11th, 1890. (Rev. A. C. Waghorne.)

ISOTHECIUM MYOSUROIDES, *HYLOCOMIOIDES, Kindb. (N. subsp.)

Branches subjulaceous, sometimes bipinnate. Leaves larger than in the type, short-acuminate, those of the branchlets subobtuse; costa stout.

On old logs at Comox, Vancouver Island, April 30th, 1887. (Macoun.)

EURHYNCHIUM SUBSCABRIDUM, Kindb. (N. sp.)

E. Sullivantii, Macoun Cat., Pt. VI, 206.

Tufts pale green above, dirty yellow below. Stem creeping, pinnate; branches subjulaceous, nearly crowded, long and attenuate, Leaves long-decurrent, not striate, very papillose on both sides, serrulate nearly all around; borders reflexed below; cells sublinear or lanceolate, those in the angles short and numerous; costa vanishing near the acumen. Stem-leaves ovate with a subfiliform point; branch-leaves ovate-oblong, generally long-acuminate. Perichetial leaves nearly entire, filiform pointed. Capsules not found. Diœcious or pseudo-monœcious.

Allied to *E. Sullivantii*, Canadian Musci., No. 296. This species was examined by James and Austin, and pronounced *E. Sullivantii*, but Lindberg, in 1871, named it differently. The specimens from Royston Park that were distributed as No. 296. See Macoun Cat. VI, page 206, for distribution. (Macoun.)

EURHYNCHIUM SUBINTEGRIFOLIUM, Kindb. (N. sp.)

Tufts green, not glossy, sparingly radiculose. Stem irregularly branching or subpinnate; branches complanate. Leaves somewhat large, long-decurrent, faintly striate, distant and subdistichous, ovate-oblong, short apiculate, nearly entire, minutely denticulate near the apex, chlorophyllose; cells sublinear, the alar short and somewhat numerous, not large; costa thin, generally reaching to the acumen. Capsule arcuate or subobovate; lid not found; pedicel long and smooth. Probably diœcious.

Habit of *Eurhynchium* (*Rhynchostegium*) *serrulatum*; allied to the European *Eurhynchium* (*Rhynchostegium*) *megapolitanum*.

On old logs in woods along the Columbia River, about one mile above Revelstoke, B.C., May 5th, 1890. (Macoun.)

EURHYNCHIUM REVELSTOKENSE, Kindb. (N sp.)

Tufts pale green. Stem pinnate, creeping; branches complanate. Leaves distichous, plicate, pellucid, ovate-lanceolate, long-subulate, minutely denticulate, sometimes short-decurrent; cells lanceolate, those in the angles short and large; costa thick, reaching to above the middle. Capsule arcuate; pedicel short and smooth. Lid and male flowers not found.

On old water-soaked logs in woods west side of the Columbia River, at Revelstoke, B.C., May 6th, 1890. (Macoun.) This species and the preceding were included in the references under *B. serrulatum* in Part VI.

EURHYNCHIUM SERRULATUM, *ERICENSE, Kindb. (N. subsp.)

Differs in the leaves being shorter, subovate, less distant, nearly crowded, also in the smaller, and short-pedicellate capsule.

On earth in woods a little west of Leamington, Essex Co., Ont., Sept. 21st, 1890. (Macoun.)

EURHYNCHIUM SERRULATUM, *HISPIDIFOLIUM, Kindb. (N. subsp.)

Differs in the branches being longer, the leaves very long, ovate-lanceolate, long-acuminate and sharply dentate. Capsules and flowers not found.

On old logs, Hastings, Burrard Inlet, B.C., April 8th, 1889. (Macoun.)

EURHYNCHIUM PSEUDO-SERRULATUM, Kindb. (N. sp.)

Rhynchostegium serrulatum Canadian Musci. No. 456.

Tufts dark green, faintly glossy, radiculose at the base. Stem irregularly branching or subpinnate; branches complanate. Leaves distichous, striate, often larger than in *E. serrulatum*, chlorophyllose, ovate or ovate-oblong, minutely denticulate, not or indistinctly decurrent; cells lanceolate, the lower shorter and more dilated, principally the alar ones; costa thin, reaching above the middle. Stem leaves filiform-pointed or short-acuminate ; branch-leaves with a short, subulate, sometimes twisted acumen. Capsule arcuate ; lid short-rostellate ; pedicel rough. Monœcious.

Differs from *E. serrulatum*, principally in the striate, minutely denticulate leaves, the capsule not rostrate, and the rough pedicel.

On earth in woods at Beechwood, Ottawa ; (Macoun.) At Tay Forks, York Co., N.B.; (J. Moser.) Western Cove, Harbor Deep, and Seal Cove, Newfoundland, 1891 ; (Rev. A. C. Waghorne.)

RAPHIDOSTEGIUM PSEUDO-RECURVANS, Kindb. (N. sp.)

Tufts olivaceous, not or faintly glossy. Leaves patent and incurved-falcate when dry, ovate-lanceolate, long acuminate, gradually narrowed to the filiform point, minutely denticulate nearly all around ; cells linear, the alar not large. Perichetial leaves long-subulate, denticulate only at the long, linear point. Capsule obovate ; lid not found ; pedicel short. Probably diœcious.

On the bases of trees west of Columbia River, and south of the Railway Bridge at Revelstoke, B.C., May 5th, 1890. (Macoun.)

HYPNUM (Drepanium) ALASKÆ, Kindb. (N. sp.)

Stem regularly pinnate, creeping. Stem-leaves small, entire, not reflexed at the borders, ovate-lanceolate, equally attenuate to a subuliform or finally hair-like acumen, shorter than the base ; alar cells inflated, very distinct, sometimes yellow, the other cells hyaline. Diœcious.

Differs from *H. callichroum* in the creeping stem, etc., from *H. curvifolium* also in the smaller leaves. It has the habit of *H. hamulosum*.

THE AIR OF OUR HOUSES.

BY FRANK T. SHUTT, M.A., F.I.S., F.C.S., 1ST VICE-PRESIDENT.

Delivered December 15th, 1892.

I have selected this subject, chiefly, for two reasons. First: although it is one of great importance, and has a vital interest for every one of us, widespread ignorance prevails regarding the grave danger to health from continuously breathing impure and vitiated air. Secondly: because it will form a fitting sequel to the lectures on Water and Food which I delivered on former occasions before this Club.

In pursuance of the course I adopted in those addresses, I propose to discuss the subject from the hygienic, as well as from the chemical, standpoint. My endeavour will be to point out the composition of pure, normal air; the nature, sources, and amounts of impurities in vitiated air; and the effects of these impurities upon the system.

THE ATMOSPHERE.

The atmosphere that surrounds our earth is composed, chiefly, of two elements—Oxygen and Nitrogen. These gases exist in the air, not as a chemical compound of the two, but in the free and uncombined condition. This can be easily and abundantly proved. I shall content myself, however, with telling you of a few of the reasons why air must be considered as a mechanical mixture of its constituents, and not a compound. The ratio, or proportion of the oxygen to the nitrogen in the air does not correspond to the ratio existing between these elements in any of the oxides of nitrogen, which are true chemical compounds. Neither the relative nor absolute amounts of the oxygen and nitrogen remain always the same and constant; and it is a *sine qua non* that the ratio between the constituents of a chemical compound should be invariable. Again, water dissolves from air both oxygen and nitrogen, but owing to the greater solubility of the former and the laws of gas absorption, the proportion between them in the dissolved air is not that existing between them in the atmosphere. For instance:

	Air dissolved in Water.	Atmospheric Air.
Oxygen	34.92	20.96
Nitrogen	65.08	79.04
	100.00	100.00

Such would not take place if the oxygen and nitrogen were chemically united.

Let me briefly remind you of some of the salient properties of these elements, and the functions they perform in the atmosphere.

OXYGEN.

Oxygen is known as the "supporter of combustion," since it is essential for combustion, whether such be accompanied by flame or not. It is the active element. It is the life-giving or, rather, life-supporting element. Without it animal life could not exist. In one of our former lectures we saw the vigour with which it united with many of the elements, giving out both light and heat, and learnt how, that of the compounds similarly formed, the rocks and the soil were very largely composed. Hence, oxygen may be termed the world-building element.

NITROGEN.

Nitrogen is an inert, inactive gas, incapable of supporting life or combustion. Its function in the atmosphere, as far as respiration is concerned, appears simply to be for the purpose of diluting the oxygen. For though oxygen is so necessary and essential for vitality, yet we could not live long in atmosphere of *pure* element. Such would shorten our lives to a very brief period, and we should hourly stand in jeopardy of an almost universal conflagration.

Roughly speaking, the air consists of one-fifth of oxygen, and four-fifths of nitrogen, by volume; but since it has been shown to be a mixture, and not a compound, we should expect to find the relative amounts of these gases variable. And this is the case, within small limits. From many hundred analyses of air made in different parts of the world, the percentage of oxygen in pure, wholesome air varies from 20.989 to 20.949 by volume. The extreme difference, then, amounts to .04 per cent. The maximum amount of oxygen is to be found in the air on the sea shore and mountain sides.

OTHER CONSTITUENTS OF AIR.

We have said that air consists chiefly of oxygen and nitrogen, but *normal* air always contains small and variable quantities of vapor of water, carbonic acid, organic matter, and ammonia and ozone. Air vitiated by breathing, as we shall see, contains some of these constituents in excess, while others of its constituents are diminished. In addition to the above it should be mentioned that in the vicinity of large smelting and chemical works, certain gases, e.g. Sulphuretted hydrogen, Hydrochloric acid, etc., may be present, and pollute and poison the air. Owing to the law of the diffusion of gases, and the prevalence of air currents, there is always present the *tendency* to preserve a constant composition of the atmosphere, and thus it is that noxious gases cannot accumulate to a dangerous degree, save under extremely artificial circumstances.

THE MOISTURE OF THE AIR.

Moisture or vapor of water, always present in the atmosphere, is the result of the evaporation of water from the ocean, lakes and rivers, as well as from the soil and vegetation. Its amount is directly dependant on the temperature. Hot air can hold or absorb more moisture than cold air. When saturated air is cooled, moisture is deposited, of which the well known condensation on the outside of a glass of cold water in summer, is an illustration. Our breath is loaded with moisture, and hence the determination of the amount of moisture in the air of a room may sometimes serve as a guide to a correct diagnosis of its condition. Over the hygrometric state of the atmosphere, of course, we have no control, though to a certain extent, and especially in winter, we can regulate the amount of moisture in the air of our houses.

EFFECT OF EXCESS OR DEFICIENCY OF MOISTURE.

It might be well here to note that an excess or deficiency (above or below the normal amount) exerts a decided action upon the health. An excess of moisture is more prejudicial than a deficiency, since, in the first place, it tends to preserve the organic matter, which is one of the chief impurities in vitiated air. It also seriously interrupts or interferes with the exhalation from the skin and lungs. When excessive moisture is associated with high temperature, we are cognizant of an oppressive and sultry feeling, and an enervation of mental and bodily vigour; with low temperature it is conducive to a damp, penetrating chilliness, which seems to search us through and through. Coughs, colds and rheumatic troubles are common when this state of atmosphere prevails. When the air is too dry, the mucous membrane of the mouth, pharynx and nostrils become parched, and the use of the voice impaired or impossible. A general irritability of the system is a common result of too dry an atmosphere.

CARBONIC ACID.

Carbonic acid gas, until quite lately, has been regarded not only as the chief impurity, but as the only impurity of vitiated air, and the one constituent that it is necessary to determine when examining an air for hygienic purposes. Important as it is that carbonic acid should not be allowed to exceed a certain amount in an air we breathe, we now know also how detrimental organic matter is, and that we must look upon *it* as probably the much more dangerous to health of the two. Carbonic acid is always present in the atmosphere. Over the sea, on mountains and moors, and in localities far from contaminating sources, it varies from .03 to .04 per cent. by volume. It is the result of the union of carbon (or charcoal) with oxygen. It is formed in the process of combustion, in the respiration of animals, and by decay or putrefaction of organic matter in the air. The chemistry, as far as the result is concerned, is precisely the same in all of these. The burning of wood, coal or other material rich in carbon and hydrogen, is accompanied by the development of heat and light. This is what is commonly understood as combustion. The products are carbonic acid gas, and water. By estimating their amounts, the chemist can tell how much carbon and hydrogen the burnt material contained. And again, knowing the weights of carbon and hydrogen in a substance, the heat that will be generated by their combustion can be calculated with accuracy, since in their union with oxygen they always produce for a known weight a certain amount of heat.

RESPIRATION.

The process of respiration is really one of combustion, though unaccompanied by flame. Our food is rich in carbon and hydrogen. Starch and sugar, fats and albuminoids, of which our food consists, all contain large amounts of these elements. The blood which receives the digested food from the alimentary track is pumped from the right side of the heart into the lungs, where it is passed through countless small capillary tubes, with extremly thin membranous walls. It is here that it comes into close contact with the inspired air, the oxygen of which it absorbs in large quantities. From the lungs it is then passed through the left side of the heart, and forced into the general circulation of the body. During its circulation, the absorbed or dissolved oxygen burns up the food material in the blood, forming carbonic acid and water, which are discharged chiefly on the reflow of the blood to the lungs though small quantities escape by way of the skin. The heat generated in the combustion of this food in the body to carbonic acid and aqueous vapor, is precisely equal to the amount that would have been produced if the food material had been burnt in the air; and it is the heat so generated that maintains our body temperature.

DECAY AND PUTREFACTION.

Decay and putrefaction have been mentioned as the third source of carbonic acid gas in the atmosphere. These processes of the disintegration and dissipation of organic matter, are really of the nature of slow combustion, usually brought about by the agency of microscopic plants, known as bacteria. Their products are much the same as those resulting from the combustion of fuel and of food.

ORGANIC MATTER.

Having now discussed the sources of the carbonic acid in the air, we must now speak of the organic matter, which is more especially present as the result of deficient ventilation.

It has already been mentioned that the deleterious character of badly ventilated rooms is due rather to the organic matter than to the carbonic acid. It is therefore of great importance that we should learn somewhat of its origin and effects upon health. Organic matter, and ammonia in small quantities, are from much the same source as the carbonic acid. Our breath contains comparatively large quantities. Air fouled by the gases produced by decay, by sewage emanations, by contact with fifth of all kinds, is loaded with organic matter, largely in the form of noxious gases, which may contain disease germs, but which, at all events, is extremely detrimental to health.

The unpleasant odour, and sometimes even taste, experienced on entering crowded and heated rooms, is due to organic matter in the atmosphere. The pleasurable sense of relief on going out into the fresh air from a room, is a sure indication that its air is seriously contaminated with organic matter. We should take care that we do not habituate ourselves to unpleasant odours of this kind. The constant smell of food in the house should be avoided, or rather prevented. Dust should not be allowed to accumulate in carpets ; worn clothing should be thoroughly aired before putting away, and above all, defective drainage should at once be made perfect

AIR VITIATED BY RESPIRATION.

Let us now briefly recapitulate those points, in which expired air differs from that of the atmosphere.

1. Its oxygen is largely reduced. By respiration between 4.5% and 5.0% of oxygen is removed for the combustion of the food material in the blood.

2. It contains a considerable amount of organic matter of a particularly deleterious character. From the lungs alone about 3 grains are thrown off daily, and to this must be added the variable amount from the exhalations of the skin.

3. The carbonic acid is largely increased. While fresh air contains about 4 volumes of carbonic acid per 10,000, expired air contains between 400 and 450 volumes in the same quantity. This tremendous increase is easily understood when we remember that the individual breathes about 18 times per minute, and at each respiration produces nearly 1⅓ cubic inches of carbonic acid. This amounts to ⅔ cubic feet per hour, or at least 16 cubic feet in the 24 hours—a quantity equal to that produced by the burning of 7½ oz. to 8 oz. of carbon.

4. The amount of aqueous vapor is augmented, for, as we have

already seen, expired air is saturated, or nearly so, with moisture. The quantity thrown off from the lungs daily is subject to variation, but is usually between 9 and 10 ounces.

EFFECTS OF VITIATED AIR ON HEALTH.

I have already pointed out that vitiated air, and more particularly air that has received largely the products of respiration, is extremely deleterious to health. But I would now emphasize the insidious character of these impurities, how they gradually undermine the health and how easy it is for us to habituate ourselves to a morbid condition of the air we breathe. Fainting fits, giddiness, nausea, and headache are recognized as the immediate results of breathing the air of badly ventilated halls and rooms, but it is not so widely known that indigesti , diarrhœa, and impaired and feeble condition of the system—a general lowering of the bodily and mental vigour are often caused by the continuous breathing of vitiated air. Those who through carelessness, or apparent necessity of circumstances, live and work in a confined atmosphere, run a great risk, for apart from immediate evil results, they are not in a condition to resist attacks of zymotic diseases. Further, statistics clearly prove that the death rate of those living and working in an impure atmosphere (e.g. certain factories, mines, crowded tenement houses, etc.), is much higher than amongst those whose more fortunate lot allows them to live and work in a purer air.

VENTILATION.

For private dwellings no cheap and efficient system of artificial ventilation has as yet been invented. For public halls, schools, hospitals, and the like, however, there are now systems by which the air may be kept perfectly wholesome without creating a draft, either in summer or winter, and at the proper degree of temperature and moisture. What we might call public ventilation should now become a matter for legislation. Our public schools, halls of assembly, and all confined spaces, where large numbers of people congregate, should all be provided with the requisite means for constantly renewing the air. As private individuals, we have to be thankful that the materials of which our houses are constructed—and more especially brick and plaster—are porous, allowing a constant interchange of the air within with that outside. We should take care to increase this interchange as much as possible by such means as are available. Draughts from open doors and windows are certainly to be avoided, but they may be overcome by judiciously placed screens and numerous other devices for distributing the current of fresh air. One such that answers admirably for the bedroom in winter is to raise the lower sash of the window, allowing it to rest on a piece of board some three inches high, and which fits snugly into the window frame. The air will now enter in a broad stream between the upper and lower sashes, and the sliding pane of the storm sash can be left open, as a rule, without fear of a draft. I might add here, that it is extremely important for the air of a bedroom to be pure and fresh, and the temperature of a room should be such as to allow the above, or some similar, method of ventilation to be practised throughout the winter. A grate fire is perhaps the very best means of assisting ventilation for private houses. If its function were only that of keeping the air of the room pure it could not be too strongly recommended, for it compels fresh air to enter by doors and windows, and by its strong draught continuously renovates the atmosphere. Looked at as a source of heat, it may be considered extravagant, but is certainly the most healthful, as well as the most pleasant and attractive of all our modes of heating. The windows should be opened for ten minutes first thing in the morning, and the whole air of the house renewed. Even on the coldest day, this will be found economical as regards fuel, as well as invigorating.

TEMPERATURE OF THE HOUSE.

One word may be said here regarding the temperature of our houses in winter, since it is a matter closely related to ventilation. It is more healthy to have the air of our bedrooms too cold than too hot, and the same remark refers, though not with equal force, to the rest of the house. I feel sure that many diseases of the lungs and throat are the result of going out of our over heated houses into the severe cold. The difference in temperature is enormous, and the system is in the worst possible condition to withstand the shock.

And now that I am about to conclude my lecture and these suggestions, which if put into practice may mean better health for many of us, let me urge upon every householder the necessity of knowing that the drains are properly trapped, and in good working order. No expense should be spared, if health is a matter of importance, in preventing the possibility of sewer gas entering the house. Then again, cellars should be drained, dry and well ventilated. Refuse and garbage should not be allowed to accumulate in or about the house. Perhaps the best means of disposing, in the city house, of vegetable refuse and general kitchen scraps is the cooking stove. From a sanitary standpoint it has not its equal.

In the matter of ventilation, as in everything else, we should use our common sense. We all have some powers of observation, we can all study cause and effect, even if we do not understand fully the chemistry that underlies it all. Let us see to it as a people—both in town and country—that in this matter of fresh air we do not err in the future as we have done in the past. We have learnt the origin and detrimental effects of foul and vitiated air; let us not from carelessness or wilful neglect refuse to take necessary means to provide our houses with fresh pure air.

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EXCURSION No. I. To LA PÊCHE.

The Excursion Committee has made the necessary arrangements for the first excursion of the season. The date selected is Saturday, May 27th, and the locality to be visited is that known as La Pêche, or Wakefield, a most picturesque and attractive resort. The party will leave the C. P. R. Union Station at 9.45 a.m. by the Gatineau Valley Railway.—Before returning the Leaders in the several sections of the Club's work will make the usual brief addresses on the results of the Outing. Bring your friends and any persons whom you know to be interested in Natural History.

Tickets, Members	50 cents.
" Non-Members	60 "
" Children of Members	25 "
" " of Non-Members	30 "

Tickets can be obtained at the Station.

SUMMARY

—— OF ——

Canadian Mining Regulations.

NOTICE.

THE following is a summary of the Regulations with respect to the manner of recording claims for *Mineral Lands*, other than Coal Lands, and the conditions governing the purchase of the same.

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therein, either by surface or subterranean prospecting, for mineral deposits, with a view to obtaining a mining location for the same, but no mining location shall be granted until actual discovery has been made of the vein, lode or deposit of mineral or metal within the limits of the location of claim.

A location for mining, except for *Iron*, shall not be more than 1500 feet in length, nor more than 600 feet in breadth. A location for mining *Iron*, shall not exceed 160 acres in area.

On discovering a mineral deposit any person may obtain a mining location, upon marking out his location on the ground, in accordance with the regulations in that behalf, and filing with the Agent of Dominion Lands for the district, within sixty days from discovery, an affidavit in form prescribed by Mining Regulations, and paying at the same time an office fee of five dollars, which will entitle the person so recording his claim to enter into possession of the location applied for.

At any time before the expiration of five years from the date of recording his claim, the claimant may, upon filing proof with the Local Agent that he has expended $500.00 in actual mining operations on the claim, by paying to the Local Agent therefor $5 per acre cash and a further sum of $50 to cover the cost of survey, obtain a patent for said claim as provided in the said Mining Regulations.

Copies of the Regulations may be obtained upon application to the Department of the Interior.

A. M. BURGESS,
Deputy of the Minister of the Interior.

DEPARTMENT OF THE INTERIOR,
Ottawa, Canada, December 1892