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NOTES ON PASSAGES IN THE PLATONIC DIALOGUES.

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NOTE I.

Ἀλλα μεν δη διοτι φιλειται ὑπο θεων, φιλουμενον ἐστι και θεοφιλες [το θεοφιλες].—(*Euthrypliro.* § 12. Bekker).

The last two words, which I have enclosed within brackets, have been added on pure conjecture—"de sola Bastii conjectura," as Stallbaum writes. They have been received by Bekker into his text; and Stallbaum, in a long note, endeavours to prove, that, without the addition, the passage has no tolerable meaning. I venture to think, however, that the emendators of the text are here in the wrong; and that the proposed addition, instead of being necessary, mars the sense of the passage.

To shew this, it will be sufficient to indicate the line of thought in that part of the dialogue where the sentence under consideration occurs. Euthyphro has given a definition of holiness as "that which is loved by the gods;" in other words, the doctrine has been laid down, that, to be God-loved (θεοφιλες), and to be holy (ὅσιον), are interchangeable expressions. Against this view Socrates directs a battery of argument, as follows:

A. 1. An object of love is not loved, because it is a loved thing (ὀυχ ὅτι φιλουμένόν ἐστι, φιλειται).

2. But it is a loved thing, because it is loved (ὁτι φιλειται, φιλουμενον).

B. 1. With reference to holiness in particular, it is loved by the Gods because it is holy (διοτι ἀρα ὁσιον ἐστι, φιλειται).

2. Its being loved by the Gods is not what makes it holy (ὀυχ ὁτι φιλειται, δια τουτο ὁσιον ἐστιν).—The circumstance of its being loved by the Gods makes it merely (A. 2) a God-loved thing (Ἀλλα μεν δη διοτι φιλειται ὑπο θεων, φιλουμενον ἐστι και θεοφιλες).—This is the sentence which is supposed to need emendation. But, taking it, as I have done, without Bast's supplement, its effect is to throw a fuller light upon the *negative* statement, that the circumstance of holiness being loved by the Gods is not what makes it holy, by shewing *positively* that this circumstance makes holiness God-loved (θεοφιλες), and nothing more.

C. Hence it follows that the holy and the God-loved are not (as Euthryphro's definition implied) the same. For, on supposition of their being the same (ἐι γε τἀυτον ἡν), a twofold contradiction arises.

First, it has been granted (B. 1) that the holy is loved because it is holy. But, by hypothesis, the holy and the God-loved are the same. Substitute, therefore, God-loved for holy in the proposition (B. 1) just quoted; and the proposition will become—the God-loved is loved because it is God-loved: which is at variance with A. 1. (Ἐι γε ταὐτον ἡν, ὠ φιλε Ἐυθυφρον, το θεοφιλες και το ὁσιον, ἐι μεν δια το ὁσιον ἐιναι ἐφιλειτο το ὁσιον, καί δια το θεοφιλες ἐιναι ἐφιλειτο ἀν το θεοφιλες).

Again, it has been granted (A. 2) that the God-loved is God-loved because it is loved by the Gods. This proposition, by the substitution of holy for God-loved, according to the hypothesis of the identity of το ὁσιον with το θεοφιλες, becomes—the holy is holy because it is loved by the Gods: which is at variance with B. 2. (Ἐι δε δια το φιλεισθαι ὑπο θεων το θεοφιλες θεοφιλες ἠν, και το ὁσιον ἀν δια το φιλεισθαι ὁσιον ἠν).

The argument thus sketched is clear, consistent, steadily progressive, and (on the premises assumed) conclusive.

Were it not for Stallbaum's extraordinary comment, I would consider it unnecessary to say anything regarding the logical propriety of the interchange (C) of the terms holy and God-loved. We must distinguish between a judgment in which one thing is merely predicated of another—as "God is good"—and a definition exhibiting the full and exact nature of the thing defined—as "a triangle is a three-sided figure." In the latter case, wherever the expression *triangle* occurs, we may without error replace it by *three-sided figure:* and conversely. But of course such a procedure would in the former case be absurd. Now Stallbaum actually argues that the passage under consideration, without some such addition as Bast has suggested, involves a fallacy, inasmuch as, the holy having been defined to be the God-loved, *ὁσιον* and *θεοφιλες* are thereafter treated as interchangeable terms! How could the learned critic forget that the proposition, "holiness is that which is loved by the Gods," is taken, throughout the argument, not as the mere predication of a quality which may belong to other objects as well as to holiness, but as a definition exhibiting exactly the essential nature of holiness? A passage of the Protagoras may be referred to by way of illustration. Protagoras had been led to identify *the pleasant* and *the good*, so as to make the proposition, "the good is that which is pleasant," a definition exhibiting the exact nature of the good. He had also asserted that men often do evil, knowing that it is evil, in consequence of being overcome by pleasures. Here Socrates takes him up, and insists that *pleasure* be replaced by *good*, according to the definition which had been given of the latter term; which being done, the doctrine of Protagoras is reduced to this: that men often do evil, knowing that it is evil, in consequence of being overcome by good. *ἡ γελοιον λεγετε πραγμα, ἐι πραττει τις κακα, γιγνωσκων ὁτι κακα ἐστιν, ὁυ δεον ἀυτα πραττειν, ἡττωμενος ὑπο των ἀγαθων.*—(*Protagoras*, § 111. Bekker.)

It may be observed, that, while endeavouring to prove that morality (more precisely, holiness) is not dependent on *the will* of God, Plato does not represent it as independent of *the nature* of God. In fact, in his maturest dialogues, as we may afterwards have occasion to point out, he connects all eternal and unchangeable reality with the Divine nature; and there is nothing in the Euthyphro at variance with such a view.

Sir James Macintosh, in his *Dissertation on the Progress of Ethical Philosophy,* describes Duns Scotus as "the first whose language inclined towards that most pernicious of moral heresies, which represents morality to be founded on will;" and he adds that William of Ockham "went so far beyond this inclination of his master, as to affirm, that, if God had commanded his creatures to hate himself, the hatred of God would ever be the duty of man." I presume that what is here meant, is, that Scotus was the first *of the scholastic writers* whose language inclined towards the heresy in question; for, the discussion in the Euthyphro, of which Sir James Mackintosh cannot have been ignorant, is sufficient to shew that there were persons even in the days of Plato who founded morality on will. Our philosopher would not have entered into an elaborate argument to disprove an opinion which no one maintained. The terms in which Macintosh characterises the doctrine which finds the ground of moral distinctions in the will of God are worthy of being quoted. "The doctrine of Ockham, which by necessary implication refuses moral attributes to the Deity, and contradicts the existence of a moral government, is practically equivalent to Atheism. As all devotional feelings have moral qualities for their sole object; as no being can inspire love or reverence otherwise than by those qualities which are naturally amiable or venerable; this doctrine would, if men were consistent, extinguish piety, or, in other words, annihilate religion. Yet so astonishing are the contradictions of human nature, that this most impious of all opinions probably originated in a pious solicitude to magnify the sovereignty of God, and to exalt his authority even above his own goodness."

NOTE II.

Ψυχη πασα ἀθανατος. το γαρ . . . . ἀθανατον ψυχη ἀν εἰη.— (*Phaedrus*, §§ 51, 52, 53. Bekker).

I am not satisfied with what the commentators whom I have had an opportunity of consulting have written regarding the structure of this famous passage. The immortality of the soul is what is sought to be established. Now the point which does not seem to me to have been made sufficiently plain, is, that the passage contains two distinct arguments; and that the premises of the one are intermingled (though not in a confused manner) with those of the other; the conclusion not being expressed in connection with each of the courses of reasoning separately, but being formally deduced, once for all, only after the premises of both arguments have been fully stated. The following scheme, in which the proposition marked *g* is the conclusion, following in a strictly logical manner from the premises of either argument, and therefore legitimately deduced by Plato from the premises of both combined, will make the matter clear.

ARGUMENT I.

a. What is always moved is immortal.
b. What is self-moving is always moved.
c. Every soul is self-moving.

ARGUMENT II.

c. Every soul is self-moving.
d. What is self-moving is a principle of motion.
e. A principle is unproduced.
f. What is unproduced is indestructible and immortal.

g. Therefore every soul is immortal.

The order in which the propositions forming the premises of these arguments are brought forward by Plato is the following:—(*a*). *το γαρ ἀεικινητον ἀθανατον.*—(*b*). *μονον δη το ἀυτο κινουν, ἀτε ὀυκ ἀπολειπον ἑαυτο, ὀυ ποτε ληγει κινουμενον.*—(*d*). *τουτο πηγη και ἀρχη κινησεως.*—(*e*). *ἀρχη δε ἀγενητον.*—(*f*). *ἐπειδη δε ἀγενητον ἐστι, και ἀδιαφθορον ἀυτο ἀναγκη ἐιναι.*—(*c*). *ἀθανατου δε πεφασμενου του ὑφ' ἑαυτου κινουμενου, ψυχης ὀυσιαν τε και λογον τουτον ἀυτον τις λεγων ὀυκ ἀισχυνειται.*

With regard to the expression in (*c*), *ἀθανατου δε πεφασμενου του ὑφ' ἑαυτου κινουμενου*, it may be remarked, that, though the position: *what is self-moving is immortal*, has not been formally and in express terms laid down in the previous part of the argument, propositions have been laid down, viz.: (*a*) and (*b*), which logically involve it.

I may add, as Ast, in a note quoted by Bekker, distinguishes between *πηγη* and *ἀρχη* in (*d*), making the former the *principium reale seu materiale*, and the latter the *principium ideale seu formale*, that there is not the shadow of a foundation for the distinction in the writings of Plato. That the alleged distinction was not in Plato's mind when he wrote the passage under consideration, and that it has nothing to do with the course of his argument, is obvious from this, that, while he employs both *πηγη* and *ἀρχη*, as if to give fullness and emphasis to the statement, in the clause where the idea of a principle first appears, he uses only the latter of these expressions in the subsequent part of the reasoning: τουτο πηγη και ἀρχη κινησεως. ·ἀρχη δε ἀγενητον κ. τ. λ.

Note III.

Ἀρχη δε ἀγενητον· ἐξ ἀρχης γαρ ἀγαγκη παν το γιγνομενον γιγνεσθαι, ἀυτην δε μηδ' ἐξ ἑνος· ἑι γαρ ἐκ του ἀρχη γιγνοιτο, ὀυκ ἀν ἐξ ἀρχης γιγνοιτο. —(*Phaedrus*, § 51. Bekker.)

The proposition, *a principle is unproduced*, which forms the Premiss (*e*) of Argument II., Note II., Plato supports by the reasoning, ἐξ ἀρχης γαρ ἀναγκη κ. τ. λ. Great difficulty, however, appears to have been found with the text as it stands; and various conjectural emendations of the last clause, ὀυκ ἀν ἐξ ἀρχης γιγνοιτο, have been suggested. From the notes in Bekker's Plato I extract the following specimens:

(*a*). ὀυκ ἀν ἀρχη γιγνοιτο (Muretus).
(*b*). ὀυκ ἀν ἐτι ἀρχη γενοιτο (Buttmann—approved by Heindorf.)
(*c*). ὀυκ ἀν ἠν ἐτι ἀρχη (Ast).
(*d*). ὀυκ ἀν ἐξ ἀρχης γιγνοιτο τουτο (Schleiermacher).

I have a strong persuasion that the text stands in no need of alteration, and that it is only in consequence of Plato's real course of thought having been misapprehended that alteration has been deemed necessary. The argument of the passage may, I conceive, be thus presented:

(α). Proposition to be proved:—A principle is unproduced (ἀρχη δε ἀγενητον).

(β). In seeking to establish this, the first position laid down, is, that every thing which is produced is of necessity produced from a principle (ἐξ ἀρχης γαρ ἀναγκη παν το γιγνομενον γιγνεσθαι). The position here asserted, which is presumed to be self-evident, leads directly to what is sought to be proved, that a principle is not produced from anything (ἀυτην δε μηδ' ἐξ ἑνος).

(γ). For suppose, if possible, that the proposition sought to be proved is not true; in other words, suppose a principle to be produced from something (ἑι γαρ ἐκ του ἀρχη γιγνοιτο).

(δ). Then, in the case supposed, the production would not take place from a principle (ὀυκ ἀν ἐξ ἀρχης γιγνοιτο), inasmuch as, if it did, there would be two principles, the one produced from the other—a view, the absurdity of which is to Plato too apparent to require to be expressly set forth.

(ε). But the conclusion (δ) is contradictory of the Premiss (β); and therefore the hypothesis (γ) is untenable. In other words, the Proposition sought to be proved is established.

While the unamended text thus yields an intelligible and (from the Platonic point of view) conclusive argument, the readings suggested by Muretus (*a*), Buttmann (*b*), and Ast (*c*), reduce the import of the reasoning contained in the clause, ἐι γαρ ἐκ του ἀρχη γιγνοιτο κ. τ. λ, to this: *a principle is unproduced, for if it were not, it would not be a principle;* where it is plain that no real advancement in the demonstration is made. Why (the reader asks) is it impossible for that which is produced to be a principle? The only conceivable answer is, that, if what is produced were a principle, there would be two principles, the one produced from the other. Now this is exactly what the unamended text expresses; so that the emendations suggested by the eminent scholars named, reject from the text an idea which Plato must be understood to have had in his mind. But more, in the passage as amended, the clause ἐξ ἀρχης γαρ ἀναγκη παν το γιγνομενον γιγνεσθαι, which we cannot suppose Plato to have introduced without a purpose, serves absolutely no purpose whatsoever.

According to Schleiermacher's amendment (*d*), τουτο refers to the preceding ἐκ του. The argument then is: *if a principle* (which we may call *P*), *is produced from anything* (as from *x*), *it will follow* that this *x* (του) *is not produced from a principle.* This view appears the most unsatisfactory of all. Besides being open to other objections, it attributes to Plato irrelevant reasoning—which we are not gratuitously to do. For, though *x* were not produced from a principle, what then? Let it be conceived that *x* is not produced at all. This does not (at least, directly) warrant the inference that *P* is unproduced.

Note IV.

Ὀιδα γαρ ἀνδρα ἑνα Πρωταγοραν πλειω χρηματα ἀπο ταυτης της σοφιας ἠ Φειδιαν γε, ὁς ὀυτω περιφανως· καλα ἐργα ἐιργαζετο, και ἀλλους δεκα των ἀνδριαντοποιων.—(*Meno.* § 29. Bekker.)

Heindorf proposes to read τε for γε; and Buttmann assents to the change: "Heindorfio assentior corrigenti τε, quam particulam ante illud και ἀλλους abesse posse non credo." Stallbaum intimates his concurrence in Buttmann's remark. On a point which is purely one of Greek scholarship, the opinion of these learned men is entitled to the highest consideration; yet I feel some difficulty in accepting their decision. *In the first place,* the particle γε is uncommonly appropriate. It has a fine delicate ironical effect. Socrates (who is the speaker) says in substance: One man, Protagoras, derived from the exercise of his talents as a sophist, an amount of money, *not greater perhaps than such a man was entitled to expect from such a profession*, but greater at any rate (γε) than was obtained from the practice of their art by Phidias and ten other statuaries besides. *In the next place,* I question, whether, if τε were substituted for γε, a sense would not be imposed upon the passage, different from what Plato wishes to express. "When we find τε in the first sentence, and και in the latter, ... the meaning conveyed is, that what is affirmed generally (τε = in any way) of the former, is affirmed in the same way in the latter (και = in this)."—(*Donaldson's New Cratylus*, p. 246.) On this principle, if the reading τε were adopted in the passage before us, the meaning would be, that Protagoras amassed more money than was earned by Phidias, or by any ten other statuaries. But this does not seem to be the exact shade of thought. Plato's meaning I take to be, that Protagoras made more money than Phidias and ten other statuaries *put together*. Now compare the following parallel passage: ὀυκ ἀποδεχομαι ἐμαυτου ὀυδε ὡς ἐπειδαν ἑνι τις προσθῃ ἑν, ἠ το ἑν ᾡ προσετεθη δυο γεγονεν, ἠ το προστεθεν και ᾡ προσετεθη δια την προσθεσιν του ἑτερου τω ἑτερῳ δυο ἐγενετο (*Phaedr.* § 104. Bekker); "I do not so much as admit, when one is added to one, either that the one to which the addition was made has become two, or that the unit to which the addition was made and that which was added to the former *taken together* (το προστεθεν και ᾡ προσετεθη) became two on account of the addition of the one to the other." Here it will be observed that τε does not occur in the first member of the expression.

Note V.

ΣΩ. Τω ὀυκ ἐιδοτι ἀρα περι ὧν ἀν μη ἐιδη ἐνεισιν ἀληθεις δοξαι περι τουτων ὧν ὀυκ ὀιδεν. MEN. Φαινεται . . . . ΣΩ. Ἐι ὀυν ὁν ἀν ᾖ χρονον και ὁν ἀν μη ᾖ ἀνθρωπος ἐνεσονται ἀυτω ἀληθεις δοξαι, ἁι ἐρωτησει ἐπεγερθεισαι ἐπιστημαι γιγνονται, ἀρ' ὀυν τον ἀει χρονον μεμαθηκυια ἐσται ἡ ψυχη ἀυτου.—(*Meno*, §§ 20, 21. Bekker).

This passage, which Stallbaum condemns as irreconcilable with the immediately preceding part of the dialogue, and as vicious in its logic, is not, in my judgment, open to either of these objections. Rightly interpreted, it is both in harmony with the rest of the dialogue, and (I say nothing of the principles which Plato assumes) unexceptionable in its logical form. The point sought to be established, is, that there never was a time, in this life or before it, when the human soul had not in it true opinions, in a latent or undeveloped state—a view involving the existence of the soul throughout at least all past time; and the several steps of the argument on which this conclusion is made to rest are as follows:

a. Learning (ὁ δη μαθησιν καλουσιν ἀνθρωποι) is reminiscence, that is, the recovery, from within the depths of one's own soul, of knowledge formerly possessed. This is supposed to be proved by an experiment performed by Socrates on one of Meno's attendants; from which it appeared that there were in the boy's mind true opinions regarding things of which he had no knowledge (τω ὀυκ ἐιδοτι ἀρα περι ὧν ἀν μη ἐιδη ἐνεισιν ἀληθεις δοξαι), and that the process of learning was merely the development of these latent true opinions into knowledge (και νυν μεν γε ἀυτω ὥς περ ὀναρ ἀρτι ἀνακεκινηνται ἁι δοξαι ἀυται).

b. In a case like that of Meno's attendant, awaking, under the interrogations of Socrates, to a knowledge of truths of which he had all his life before been ignorant, the knowledge acquired, as it was not always possessed (ὀυκοῦν ἐι μὲν ἀει ἐιχεν, ἀει και ἦν ἐπιστημων), and as it is seen to be not an absolutely new acquisition, but merely the development of what has been lying dormant in the mind, must have been received at some former time (Ἀρ' ὀυν ὀυ την ἐπιστημην, ἥν νῦν ὁυτος ἐχει, ἤτοι ἐλαβε ποτε ἢ ἀει ἐιχεν; ναι). Since, by hypothesis, it was not received at any previous time in the present life (ἡ δεδιδαχε τις τουτον γεωμετρειν; ὀυτος γαρ κ. τ. λ), it must have been received at a time antecedent to the present life (ἐι δε μη ἐν τω νυν βιω λαβων ὀυκ ᾔδει τουτο, δηλον ὀτι ἐν ἀλλω τινι χρονω ἐιχε και μεμαθηκει).—There is a point here which needs a word of explanation. If knowledge now gained for the first time in the present life be old knowledge revived, the knowledge must unquestionably have been *possessed* in a former life. Does this, however, imply that it must have been *received* in a former life? Only if we assume that the possession of knowledge is conditioned upon the reception of it, in other words, upon an act of learning. Now Plato does, in fact, make this assumption. Knowledge not being necessarily and always in the mind (ὀυκουν ἐι μεν ὀει ἐιχεν, ἀει και ἠν ἐπιστημων), the circumstance of its being found at any time in our possession, is regarded as a result and evidence of its having been received or learned. Observe the expression, ἐιχε και μεμαθηκει. He—Meno's attendant—*was in possession of* such and such knowledge, and *had learned it;* which is equivalent to: *he was in possession of it through having learned it.*

c. Since (*a*) learning is reminiscence, or the development of latent true opinions into knowledge; and since (*b*) we had knowledge, resulting from our having learned, at a time antecedent to the present life, it follows, that, at a time antecedent to the present life, the soul was in possession of ἀληθεις δοξαι, capable of being evoked into ἐπιστημαι.

d. Hence there never has been a time, in this life, or before it, when the soul was not in possession of ἀληθεις δοξαι (ἐι ὀυν ὀν ἀν ᾐ χρονον και ὀν ἀν μη ᾐ ἀνθρωπος, ἐνεσονται ἀυτω ἀληθεις δοξαι, ἀι ἐρωτησει ἐπεγερθεισαι ἐπιστημαι γιγνονται, ἀρ' ὀυν τον ἀει χρονον μεμαθηκυια ἐσται ἡ ψυχη ἀυτου; δηλον γαρ ὀτι τον παντα χρονον ἐστιν ἠ ὀυκ ἐστιν ἀνθρωπος).—Stallbaum represents Plato as here arguing, that, because ἀληθεις δοξαι not only are in the soul now, but were in it before our birth into this world, it must have possessed them always. His words are: "Animadvertes autem hanc argumentationem. Opiniones illas, inquit, quae interrogando excitatae scientiam efficiunt, non in hac demum vita accipit homo, sed animus secum attulit, quum in hoc corpus migraret. Quum igitur illas et eo tempore habuerit, quo nondum natus erat, et easdem in hac vita semper teneat, sequitur ut eas τον ἀει χρονον susceperit." Of course, nothing can be feebler than the case so put: as Stallbaum remarks: "Quae quidem conclusio quam arguta, quamque infirma sit, nemo non videt." It is doing Plato gross injustice, however, to father such weakness upon him. We may perhaps be of opinion, that, in winding up his argument, he does not express himself so fully as he might have done; but the reasoning, as he has left it, may have been sufficient for those to whom it was addressed; and, at any rate, he is entitled to a candid and liberal interpretation of his language. What he *should* have said, to render his argument logically complete, is sufficiently obvious. Starting with the simple fact, that, in this life, say L_1, the soul has in it true opinions capable of being developed into knowledge, he has inferred (*c*) that the same thing holds good of a previous life, say L_2. Now, in order that he might reach his grand conclusion, it was only necessary for him to add, that, by a repetition of the reasoning, the same thing could be shewn to hold good regarding a still prior life, say L_3; and so on, without limit. The terms L_1, L_2, L_3, &c., forming an infinite series, carry us back through all time (*παντα χρονον*); and, let us recede into the past as far as we please, we never reach a point where the soul is not in possession of latent true opinions, or, what is involved in this, where it is not found in the condition of having learned (*τον ἀει χρονον μεμαθηκυια ἐσται*) This is manifestly what Plato should have said. Is it not what he *has* said? In substance, I believe it is. His statement is exactly to the following effect: *true opinions are in the soul of any one, both while he is a man, and while he is not* [not simply before he became a man, but (*ὃν ἀν μη ᾖ ἀνθρωπος*) during all the time when he was not a man, in other words, throughout the whole time that preceded his birth]; *therefore*, &c. The first position here laid down, that true opinions are in a person's soul while he is a man, has been proved by the example of Meno's attendant. The proof of the next position, that true opinions were in the person during the whole of the time when he was not a man, has not indeed been fully drawn out in a formal manner. But having demonstrated (as he conceives himself to have done) that true opinions were in the soul in a life anterior to the present, and having demonstrated this as a corollary from the fact that they are in the soul in the present life, Plato probably thought that his readers would have no difficulty in perceiving for themselves that the same considerations which evince the present life to be the sequel of a preceding, in which the soul had true opinions in it, are sufficient to warrant the conclusion that that preceding life was the sequel of one prior still, in which also the soul had true opinions in it; and so on without limit, through all past time.—Q. E. D.

The passage which Stallbaum regards as inconsistent with that which has been expounded, is the following: Ἁτε ὀυν ἡ ψυχη ὀθανατος τε ὀυσα και πολλακις γεγονυια, και ἑωρακυια και τα ἐνθαδε και τα ἐν Ἁιδου και παντα χρηματα, ὀυκ ἐστιν ὁ τι ὀυ μεκαθηκεν, ὡστε ὀυδεν θαυμαστον και περι ἀρετης και περι αλλων ὁιον τε ἐιναι ἀυτην ἀναμνησθηναι ἁ γε και προτερον ἠπιστατο. ἁτε γαρ της φυσεως ἁπασης συγγενους ὀυσης, και μεμαθηκυιας της ψυχης ἁπαντα, ὀυδεν κωλυει ἑν μονον ἀναμνησθεντα, ὁ δη μαθησιν καλουσιν ἀνθρωποι, τἀλλα παντα ἀυτον ἀνευρειν.—(*Meno*, § 15). Stallbaum's words are: "Quum enim in superiore disputatione" (the passage just quoted, the *earlier* of the two) "animum in alia atque alia loca migrasse eoque modo omnia didicisse dixerit, ecquis est quin male hic" (the passage discussed in the former part of our Note, *the later* of the two) "affiirmari sentiat animum veras opiniones semper habuisse et tenuisse?" It would be very strange if this criticism were well founded. That Plato propounds, not only in the same dialogue, but in immediate juxta-position, two flatly contradictory theories on an important subject—is what we must not, except on the most distinct evidence, be asked to believe. But what ground is there for the charge of inconsistency? In the earlier passage, the soul, assumed to be immortal, is represented as having been often generated (πολλακις γεγονυια) into new states of being. It is not necessary to restrict the word πολλακις to any definite number of times. The circumstance, that the frequent generation spoken of is viewed as a consequence of the soul's immortality, leads us rather to suppose that an unlimited series of generations is intended. Now, the doctrine that the human soul has undergone an unlimited series of generations in time past, has been shewn to be necessarily involved in the later passage likewise. Again, according to the earlier passage, the soul, having undergone frequent generation, and passed often to and from Hades, has—thus migrating "in alia atque alia loca"—learned all things (ὀυκ ἐστιν ὁ τι ὀυ μεμαθηκεν). Here we must by no means assume (as Stallbaum appears to have done) that *a learning for the first time* is meant. This, of course, would be irreconcilable with the view brought out in the later passage, that the soul never was without having learned. But Plato says nothing about the soul learning things for the first time. He merely says that the soul during its past existence learned all things; and this is precisely what is taught in the later passage. For while it is there demonstrated that Meno's attendant had learned geometry, and so obtained an acquaintance with that science (ἐιχε και μεμαθηκει) in a former state of being, the remark is added, that the demonstration is applicable, not to a few geometrical propositions merely, but to the whole range of truth (ὁυτος γαρ ποιησει περι πασης γεωμετριας τἀυτα ταυτα, και των ἀλλων μαθηματων ἁπαντων).

The expression τα ἐνθαδε, in the earlier passage, is worthy of notice, as shewing, that, when Plato wrote the *Meno*, he held the opinion that not merely *our apprehensions of eternal and immutable truths*, but also, in part, *our mental representations of absent objects of sense*, are the revival of knowledge which we possessed in a former life. The same thing is apparent from the words ἁτε γαρ της φυσεως ἁπασης συγγενους ὀυσης . . . . ἀυτον ἀνευρειν. The term φυσις, though employed in a wide sense to include what may be termed the universe of abstract truths, cannot be taken as exclusive of the universe of sensible objects; and therefore the import of the sentence is, that, since all things in nature, sensible and supra-sensible, are of kin, the knowledge of any one may reawaken the knowledge which we formerly had (either in this life or in a preceding) of any other. The *Meno* in this respect differs from the *Phaedrus*, where the hypothesis of our possession of knowledge in a former life is advanced solely to account for our apprehensions of eternal and uchangeable truth.

Note VI.

Ὁτι προσαγορευεις ἀυτα ἀνομοια ὀντα ἑτερω, φησομεν, ὀνοματι. λεγεις γαρ ἀγαθα παντ' ἐιναι τα ἡδεα.—(*Philebus*, § 7. Bekker).

From Stallbaum's remarks, quoted by Bekker, it appears that the word ἑτερω in this passage has greatly perplexed commentators. The solution of the supposed difficulty, which finds most favour with Stallbaum, is, to take ἑτερω ὀνοματι as signifying *improprio nomine*. Should this rendering not be adopted, he would, with Heindorf, change ἑτερω into ἑνι γε τω. I am not able to see any reason either for altering the text, or for departing from the ordinary meaning of ἑτερω. Protarchus has undertaken to defend the position, that pleasure is the *summum bonum*. In opposition to this, Socrates has urged that pleasures are various, some being very unlike others.

Protarchus, though it was with difficulty that he was brought to concede the point, does at last grant in a sort of way that it may be so; and asks,—"Well, what then?" The answer of Socrates (ὁτι προσαγορευεις κ. τ. λ) is in substance:—The admission made has a direct bearing on the question in dispute. For, you call pleasures, which are dissimilar from one another, by a different name (ἑτερῳ ὀνοματι) from pleasure, namely, by the name *good* (λεγεις γαρ ἀγαθα παντ' ἐιναι τα ἡδεα). Now, had you confined yourself to the single name *pleasure*, you would have been in no difficulty; since, dissimilar as pleasures are, no one can deny that they are all pleasures (το μεν ὀυν μη ὀυχ ἡδεα ἐιναι τα ἡδεα λογος ὀυδεις ἀμφισβητει). But when, though you do not go so far as I do in saying that the mass of pleasures are evil and that some only are good, you acknowledge pleasures to be dissimilar, and nevertheless call them all by this other name of *good* (κακα δ' ὀντ ἀυτων τα πολλα και ἀγαθα δε, ὡς ἡμεις φαμεν, ὁμως παντα συ προσαγορευεις ἀγαθα ἀυτα, ὁμολογων ἀνομοια ἐιναι, τῳ λογῳ ἐι τις σε προσαναγκαζοι), you are bound to shew what that is, common to all pleasures, the bad and the good (as I term them) alike, which you express by the term *good* (τι ὀυν δη ταυτον ἐν ταις κακαις ὁμοιως και ἐν ἀγαθαις ἐνον πασας ἡδονας ἀγαθον ἐιναι προsαγορευεις).—Here Protarchus, blinking the real point of his opponent's argument, and seizing hold of the incidental circumstance that Socrates had stated some pleasures to be good and others bad, asks how Socrates could expect him, or any one who had defined pleasure to be *the good*, to admit that any pleasure can be bad (πως λεγεις, ὠ Σωκρατες; ὀιει γαρ τινα κ. τ. λ). Of course, this πως λεγεις of Protarchus was merely a trick of fence; for Socrates had himself indicated that he did not expect Protarchus to agree with him in describing certain pleasures as bad (ὡς ἡμεις φαμεν contrasted with συ προsαγορευεις), nor had he founded his argument upon the idea that pleasures are some good and others bad, but only on the admitted fact that they are dissimilar. The response is therefore directly given: ἀλλ' ὀυν ἀνομοιους γε φησεις ἀυτας ἀλληλαις ἐιναι και τινας ἐναντιας.

The above explanation will shew how utterly at sea Stallbaum is in his criticism. "Seriem disputationis," he says, "si spectamus, sensus requiritur hic: *id certe efficitur, voluptates non esse communi boni nomine appellandas, ut quae saepenumero etiam malae sint*. Quod quum verbis non inesse videtur, varias tantarunt emendationes viri docti." That the *series disputationis* would lead us to expect any such sentiment as that to which Stallbaum gives expression, I utterly deny. Though it was the opinion of Socrates himself that pleasures are often bad (ὡς ἡμεις φαμεν), the reasoning was far from being ripe for the affirmation of this as an established point, on which to base the conclusion, that pleasures ought not to be called indiscriminately *communi boni nomine*. In fact, as has been already brought out, Socrates neither expected nor asked Protarchus to admit that pleasures are in every case bad.

Note VII.

Και παλιν ἐπι την των ἡδονων πηγην ἰτεον. ὡς γαρ διενοηθημεν ἀυτας μιγνυναι, τα των ἀληθων μορια πρωτον, ὀυκ ἐξεγενηθη ἡμιν, ἀλλα δια το πασαν ἀγαπᾶν ἐπιστημην ἐις ταυτον μεθειμεν ἀθροας και προσθε των ἡδονων.—(*Philebus*, § 149. Bekker.)

Stallbaum declares this passage to be "aperte mutilatus." It seems that [illegible]indorf also was troubled in his mind regarding it; for Stallbaum [illegible]tions, towards the conclusion of his note on the subject, that, [illegible] having committed his own views to writing, he obtained a sight of the "exemplar Platonis Heindorfianum," and found written on the margin over against the passage: "Locus mancus videtur, nec sine libris MSS. explendus." Heindorf's correction of ἐξεγενετο for ἐξεγενηθη, approved by Stallbaum, should probably be received; but I am convinced, in opposition to these eminent men, that no further emendation is necessary.

In order that the passage may be understood, some explanation must be given as to what precedes. It has been proved that neither a life of intellect without pleasure, nor a life of pleasure without intellect, is desirable; but that the life which is to possess the character of *good* in the highest degree must be one in which intellect and pleasure are conjoined. The question then arises: in what way are pleasures, and the various kinds of knowledge, to be mingled together, so as to produce the most desirable life? By a lively representation, Socrates imagines himself standing beside two fountains; the one of Pleasure—a fountain of honey; the other of Intellect—a sober fountain of salubrious water; and, like some ὀινοχοος, he has to compound *the most desirable life* out of the ingredients contained in these fountains. He proceeds with his task as follows.

a. First, he asks: Shall every species of pleasure be mingled together with every form of knowledge? ἀρα πασαν ἡδονην πασῃ φρονησει μιγνυντες του καλως ἀν μαλιστ' ἐπιτυχοιμεν; (§ 145).

b. It is felt that this might not be a safe procedure; and therefore Socrates, recalling a distinction which had been drawn in a previous part of the dialogue, between pleasures as more or less true, and between forms of knowledge as more or less true, puts the question: ὀυκουν ἐι ταληθεστατα τμηματα ἑκατερας ἴδοιμεν πρωτον ξυμμιξαντες, ἀρ' ἱκανα ταυτα ξυγκεκραμενα τον ἀγαπητοτατον βιον ἀπεργασαμενα παρεχειν ἡμιν, ἠ τινος ἐτι προσδεομεθα και των μη τοιουτων; (§ 146). The construction of this sentence is rather difficult; but Stallbaum appears to be right in observing that ἀρα is to be taken in the sense of ποτερον, and that we must supply before ἐι the expression ὀρθως ἀν ποιοιμεν. The meaning then is: shall we not be doing right, if, commencing by mixing together the truest portions of each of the two classes of knowledge and pleasure, we contemplate the life thus produced, and consider whether it is the most desirable that can be framed, or whether we require to add some ingredients distinct from those already used? Protarchus answers: ἐμοι γουν δοκει δραν ὀυτως—thus assenting to the course of procedure suggested.

c. No difficulty is felt in determining that *all the truer forms of knowledge*, in other words, all those ἐπιστημαι which have for their objects eternal and immutable realities, must enter into the life that is to be in the highest degree good, Ἐστω δη τις ἡμιν φρονων ἀνθρωπος ἀυτης περι δικαιοσυνης, ὁ τι ἐστι, κ. τ. λ (§ 147).

d. According to the line of investigation proposed (*b*), the question should now have been taken up, whether *all the truer pleasures* must have a place in the most desirable life; but (as will fall to be again noticed) the scheme which was laid down is departed from, and the enquiry is pursued with respect to the *less true kinds of knowledge*. These, it is decided, must be introduced into the ἀγαπητοτατος βιος, no less than the truer; so that no species of knowledge is rejected. ΠΡΩ. Ὀυκουν ἐγωγε ὀιδα, ὠ Σωκρατες, ὁ τι τις ἀν βλαπτοιτο πασας λαβων τας ἀλλας ἐπιστημας, ἐχων τας πρωτας. ΣΩ. Μεθιω δη τας ξυμπασας ῥειν ἐις την της Ὁμηρου και μαλα ποιητικης μισγαγκειας ὑποδοχην; ΠΡΩ. Παvυ μεν ὀυν μεθειvται (§§ 148, 149).

(*e.*) *Pleasures* fall next to be disposed of (και παλιν ἐπι την των ἡδονων πηγην ἰτεον. § 150.) The term παλιν need not create difficulty.

The investigation had commenced (*a*) with the enquiry whether all pleasures were to be mixed with all kinds of knowledge; but the question in this form was departed from; and, the fountain of pleasure being for a time left out of view, attention was confined to the fountain of knowledge. Now, however, that a decision has been given regarding knowledge in all its grades, "let us" (says Socrates) "go back to the fountain of the pleasures."—The real knot which interpreters have found in the passage is what follows, where Socrates is (it is supposed) made to say that certain pleasures have already been mixed into the life that is being compounded: a thing which, in fact, has not been done. Stallbaum's words are: "Loquitur nunc Socrates de voluptatum mixtione tanquam jam peracta, quum antea nonnisi de scientiarum atque artium ad vitam beatam necessitate disseruerit. Enimvero si quis verba ὡς γαρ διενοηθημεν ἀυτας μιγνυναι κ. τ. λ. ut sensus flagitat, ad ἐπιστημας referat, repugnabit huic rationi grammatica verborum structura; sin vero illa ad ἡδονας trahas, ut ipsa constructionis natura fert, exacerbati tibi reclamabunt Socratis manes, qui non passuri sint, virum sapientissimum ea, quae nondum facta sunt, jam facta dicere." Most astonishing criticism! What do the words ὡς γαρ κ. τ. λ. really affirm? Not that pleasures of any description had already been mixed into the life that was being compounded, but that Socrates and Protarchus had entertained the thought (διενοηθημεν ἀυτας μιγνυναι) of introducing them at a certain stage, not indeed in the gross, but the true pleasures first (τα των ἀληθων μορια πρωτον). This thought or purpose *had* been entertained (*b*); but (*d*) it had not been carried into effect: a circumstance to which Socrates immediately adverts, in the words ὀυκ ἐξεγενετο ἡμιν. He, moreover, jestingly assigns as the reason which had rendered it impossible for him to carry out the order of investigation originally agreed upon, his love for all the modes of knowledge (ἀλλα δια το πασαν ἀγαπᾶν ἐπιστημην ἐις ταυτον μεθειμεν ἀθροας και προσθε των ἡδονων).

Can anything be more natural and easy than the above interpretation? In my humble opinion, with the single substitution of ἐξεγενετο for ἐξεγενηθη, the passage may remain unaltered, and yet the Shade of Socrates rest in peace.

MATERIALS FOR A FAUNA CANADENSIS.

[*Continued from page* 401.]

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Ord. NEUROPTERA. Fam. PHRYGANEIDA (Caddis-flies.)

WE adopt here, not without hesitation, the sub-divisions given by Hagen, in the valuable synopsis of American *Neuroptera* prepared by him for the Smithsonian Institution, and published in the *Smithsonian Miscellaneous Collections*, from which work we have selected the species likely to be met with in Canada. We have thrown the characters of the sub-families and genera into a tabular form for the convenience of the student. It will be observed that the first division for the determination of the sub-families supposes our possession of specimens of both sexes. Where this is not the case, the characters immediately marking the sub-families will in general remove doubt. Thus, if the specimen be a female, having therefore always five articulations to the maxillary palpi, and having three ocelli, the latter character excludes two sub-families. Among the remainder, the structure of the last articulation will distinguish *Hydropsychina*; and if our specimen is not found to belong to this sub-family, the *Rhyacophilinae* would be without transverse nervures to the anterior wings, and the shape of these wings would distinguish *Limnophilina* from *Phryganeina*. We have added auxiliary characters to those given by our author, in order to remove the difficulty here noticed. Another change we have ventured to make. As in other branches of Zoology the terminations in *ida* or *idae* mark the greater families, and those in *ina* or *inae* the sub-families, we have thought it convenient to follow this rule in Entomology also, the deviation from it being, we presume, accidental, and supported by no reason.

Table of Sub-Families.

Phryganeida. Maxillary palpi always five in females

- differing in the sexes — ocelli
  - three — max. palpi much longer than the labial: wings with transverse nervures
    - 4 articulate in males. Spurs 2, 4, 4........... *Phryganeina.*
    - 3 articulate in males; anterior wings rather narrow, the apex obliquely truncated or rounded.... *Limnophilina.*
  - none. Wings without transverse nervures, palpi pilose, maxillary shorter, or not longer than the labial .... *Sericostomina.*
- alike in the sexes
  - elongated, hirsute, last joint moveable; antennae setaceous, long, or very long; ocelli none .... *Leptocerina.*
  - last joint very long, filiform, subdivided; ocelli 3 or none; anterior wings without transverse nervures; posterior folded .... *Hydropsychina.*
  - last joint entire, straight, shorter than the rest; anterior wings without transverse nervures: posterior not folded .... *Rhyacophilina.*

Genera of Phryganeina.

Anterior wings

- naked or nearly so, rather broad, apex ovate, antennae shorter than the wings .... *Neuronia.*
- pilose, antennae robust, as long as the wings .... *Phryganea.*

Genera of Limnophilina.

Spurs on the tarsi

- 1, 3, 4 — apex of anterior wings
  - truncated .... *Limnophilus*, Leach.
  - elliptical .... *Anabolia*, Stephens.
- 1, 3, 3 .... *Hallesus*, Stephens.
- 1, 2, 2 .... *Enoicyla*, Rambur.
- 1, 2, 4 .... *Apatania*, Kolenati.

Genera of Sericostomina.

Spurs on the tarsi

- 2, 2, 4. Max. palpi masking the face, recurved .... *Notidobia*, Stephens.
- 2, 3, 3 .... *Brachycentrus*, Curtis.
- 2, 4, 4 .... *Mormonia*, Stephens.
- 2, 2, 2 .... *Dasystoma*, Rambur.
- male, 0, 3, 4; fem., 0, 2, 4 .... *Hydroptila*, Dalman.

Genera of LEPTOCERINA.

Spurs on the tarsi		
2, 4, 4		*Molanna*, Curtis.
2, 2, 2		*Leptocerus*, Leach.
0, 2, 2		*Setodes*, Rambur.

Genera of HYDROPSYCHINA.

Spurs on the tarsi			
2, 2, 4. Ocelli none; antennae extremely long; second joint of max. palpi longer than first; fifth extremely long; intermediate feet of female dilated			*Macronema*, Pictet.
2, 4, 4	ocelli none	second joint of max. palpi long; fifth equal to the sum of all the others	*Hydropsycho*, Pictet.
		second, third, and fourth joints of max. palpi equal, longer than first; wings rather acute, narrow	*Psychomyia*, Latreille.
		third joint of max. palpi longer than the other, almost equal to the fifth	*Tinodes*, Stephens.
	ocelli 3		*Philopotamus*, Leach.
3, 4, 4. Ocelli none; antennae thick, rather short; intermediate feet of female dilated			*Polycentropus*, Curtis.

Genera of RHYACOPHILINA.

Spurs on the tarsi		
3, 4, 4. Ocelli 3		*Rhyacophila*, Pictet.
2, 4, 4. Ocelli	none; palpi densely pilose; first joint of the antennae thick, pilose	*Beraea*, Stephens.
	three; basal joint of max. palpi short; the others longer, equal	*Chimarrha*, Leach.

SYNOPSIS OF SPECIES NOT UNLIKELY TO OCCUR IN CANADA.

Subfam. PHRYGANEINA.

Gen. NEURONIA. Leach.

N. IRRORATA, *Gmelin*.—Rufous, shining; antennae blackish-piceous, the basal joint rufous within; head and thorax clothed with white hairs; feet luteous, with black spines; abdomen testaceous; anterior wings whitish hyaline densely, transversely irrorated with fuscous; posterior wings hyaline, the apex spotted with fuscous, the anterior margin with a medial, larger, fuscous spot. Length 18 millim.; alar expanse 32 millim. Red River, Rupert's Land, and far South.

N. PARDALIS, *Walker*.—Black, clothed with luteous hair, beneath luteous; anterior femora ferruginous; anterior wings confertly pointed with luteous spots [confluent in the males]; posterior wings anteriorly pointed with luteous, and with a broad luteous sub-apical band. Length 27 millim.; alar expanse 50 millim. Nova Scotia.

N. OCELLIGERA, *Walker*.—Black, with pale hair; tibiae piceous; wings testaceous, the anterior ones reticulated and dotted with black. Length 26 millim.; alar expanse 28 millim. Nova Scotia.

N. SEMIFASCIATA, *Say*.—Fulvous; antennae annulated with fuscous, the apex fulvous; head fuscous; dorsum of the mesothorax each side black; head and thorax partly ciliated with black; feet with brown spines; wings fulvous, the veins obscurer, the anterior ones transversely flecked with brownish-black, a small basal spot, and an abrupt medial streak at the posterior margin, brownish black, the disk with two yellowish points; posterior wings with the apical margin hardly irrorated with fuscous, having a short fuscous subapical band.

Male: Having the dorsal lamina elongated, the sides involuted, the apex with two long spines; superior appendages larger than the lamina; ventral lamina 4-toothed.

Female: Ventral lamina shining, the base brownish-black, very much narrower at the apex, recurved, bifid. Length 23–28 millim.; alar expanse 44–52 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston), Nova Scotia, Ohio, Pennsylvania, Massachusetts, New York, &c.

N. POSTICA, *Walker*.—Fulvous; antennae annulated with fuscous, the apex fulvous; head and thorax fuscous, with fuscous hair; feet with fulvous spines; wings fulvous, veins of the same colour; the anterior ones transversely irrorated with fuscous, a small basal spot and an abrupt streak upon the middle of the posterior margin, fuscous; disk, with two whitish points; hind wings with an angulated, subapical, fuscous band.

Male: Having the dorsal lamina elongated, the apex narrower, incised; superior appendages with a longer lamina; the ventral lamina bidentate.

Female: Ventral lamina shining, middle of the base brownish-black, each side ciliated with fulvous, the apex narrow, recurved, entire; each side with a rather long anal palpus. Length 28 millim.; alar expanse 52 millim.

Massachussetts, Pennsylvania, and North Red River, Rupert's Land; also Southward.

N. OCELLIFERA, *Walker.*—Fulvous; antennae shorter, fuscous; thorax ciliated with fuscous gray; wings short, fulvous, veins of the same colour; anterior wings a little transversely irrorated with fuscous, a medial spot upon the posterior margin fuscous; disk with two whitish points; posterior wings with an angulated band, which is subapical, fuscous; feet with gray spines.

Male: Dorsal lamina long, acute, ensiform, bifid, superior appendages shorter than the lamina; ventral lamina bidentate.

Female: Ventral lamina shining, middle of the base fuscous; the apex narrower, recurved bi-impressed ciliated. Length 20 millim.; alar expanse 40–42 millim.

N. Illinois; N. Red River, Rupert's Land (Kennicott); Ohio,

Gen. PHRYGANEA. Linn.

PHR. CINEREA, *Walker.*—Testaceous, striped above with cinerous; apex of the anterior tibiae, and tips of the joints of the anterior tarsi black; anterior wings fuscous, densely dotted with cinerous; posterior wings fusco-cinerous. Length 26-28 millim.; alar expanse 48–54 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

Subfam. LIMNOPHILINA.

Gen. LIMNOPHILUS. Leach.

§ 1. Posterior wings with the middle of the hind margin emarginated.

L. PERPUSILLUS, *Walker.*—Testaceous, with testaceous hair; antennae fulvous; anterior wings narrow, the apex subacuminate, subtestaceous, posteriorly and the apex obscurely dotted; veins fulvous; posterior wings whitish. Length 7 millim; alar expanse 13 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

§2. Anterior wings narrow, the apex broader, obliquely truncated.

L. RHOMBICUS, *Linn.*—Ochreous, with luteous hair, antennae luteous; thorax luteo-fuscous; feet luteous; tibiae with yellow, tarsi with black spines; anterior wings ochreous, rufous posteriorly, with a large discoidal, oblique, rhombical spot, and another not well defined about the anastomosis, subhyaline; posterior wings hyaline, the apex subflavescent.

Male: Posterior wings underneath with a subapical fuscous fringe; superior appendages oblong, the apex and beneath a little emarginated, with black teeth. Length 23 millim.; alar expanse 44 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston), Europe and Asia.

L. DOSSUARIUS, *Say.*—Pale ochreous; antennae fuscous; abdomen obscure, apex of the segments pale; anterior wings whitish-yellow, veins black; some transverse, sometimes dilated, lines, a pterostigmatical, quadrangular spot, and an anal one, black; posterior wings with two costal spots, and the margin obscure. Length 11 millim.; alar expanse 22 millim.

Salem, Mass.

L. EXTERNUS, *Hagen.*—Luteous; head and thorax obscure above, with luteous hair; antennae with the base luteous; feet ochreous, with black spines; apex of the abdomen obscurer; anterior wings shining, narrow, sub-luteo-pilose, luteous, densely dotted with fuscous, the marks often confluent; a rhombical spot upon the middle, which is oblique, narrow, hyaline; the anterior margin immaculate; at the anastomosis a few spots; veins luteous, the fourth apical areole narrow at the base, shorter than the rest; posterior wings luteo-hyaline.

Female: The four anal appendages almost equal, short, acute; the valvule short, incised. Length 20 millim.; alar expanse 38 millim.

N. Red River, Rupert's Land (Kennicott.)

L. HYALANUS, *Hagen.*—Pale ochreous, with yellow hair; antennae ochreous; feet pale, with black spines; anterior wings pale ochreo-hyaline, somewhat glossy, veins ochreous; the fourth apical cellule acute at the base; posterior wings pale yellowish hyaline.

Male: Superior appendages ovate, prominent; the inferior ones broadly acute. Length 12 millim.; alar expanse 22 millim.

N. Red River, Rupert's Land (Kennicott.)

§ 3.

L. DESPECTUS, *Walker.*—Greyish-ferrugenous, with pale pile, and longer hair, which is black; antennae subfuscous, bases of the articulations testaceous; maxillary palpi fuscous, labial palpi testaceous; abdomen and feet testaceous; mesothorax with a double whitish streak above; anterior wings fuscous, freckled with whitish; thyridium and first subapical areole with a whitish spot; costa and disk towards the apex still more whitish; posterior wings whitish. Length 11 millim.; alar expanse 21 millim.

Nova Scotia.

L. MULTIFARIUS, *Walker*.—Black, with pale hair, and longer pile, which is black; antennae fuscous, annulated with testaceous; feet testaceous; anterior wings fuscous, freckled with whitish; thyridium and base of the apical areole spotted with white; posterior wings cinerious. Length 11 millim.; alar expanse 21 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

L. INDIVISUS, *Walker*.—Pale testaceous; antennae a little obscure; anterior wings subtestaceous, subtuberculated, veins testaceous, pterostigma subfuscous; posterior wings hyaline. Length 15 millim.; alar expanse 28 millim.

Nova Scotia.

L. SUBGUTTATUS, *Walker*.—Testaceous with pale hair; base of the anterior wings, margin behind, and apex subguttated with whitish, a fuscous spot at the pterostigma, which is broadly surrounded with hyaline; posterior wings subhyaline. Length 12 millim.; alar expanse 23 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

L. PLAGA, *Walker*.—Testaceous, with pale hair, and longer black pile; anterior wings pale testaceous, a large, subquadrate, fuscous spot behind the middle; the apex subreticulated with fuscous, and with two patches of fuscous. Length 13 millim.; alar expanse 21 millim.

Nova Scotia.

§ 4.

L. BIMACULATUS, *Walker*.—Testaceous, with pale hair and longer black pile; antennae ferruginous; thorax bivittated with piceous; anterior wings obsoletely irrorated with pale, especially at the base; posterior wings whitish. Length 19 millim.; alar expanse 34 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

Gen. ANABOLIA. Stephens.

A. SORDIDA, *Hagen*.—Rufo-fuscous, with black hair; antennae fuscous; head and disk of the thorax rufous; feet rufo-fuscous, with black spines, the tibiae obscurer exteriorly; anterior wings soiled-luteous, densely pointed with fuscous, almost naked, finely rugulose, thyridium pale; elevated veins smooth, fuscous, the apex partly interrupted with luteous; posterior wings fusco-hyaline.

Male: Superior anal appendages long, laminated, the apex a little oblique; inferior appendages acute, a little shorter, oblique. Length 18 millim; alar expanse 35 millim.

N. Red River, Rupert's Land; Northern Illinois.

A. PUNCTATISSIMA, *Walker.*—Testaceous, broad; antennae stout; anterior wings broad, finely rugulose, closely freckled with whitish, the anterior margin almost whitish; a spot upon the middle, and the thyridium whitish; posterior wings whitish. Length 13 millim.; alar expanse 25 millim.

Nova Scotia.

A. MODESTA, *Hagen.*—Nigro-piceous, with black hair; antennae black, narrowly annulated with luteous; feet luteous, with black spines, femora piceous; anterior wings obtuse at the apex, fuscous, almost naked, subrugulose, sparingly irrorated with luteous, veins fuscous; posterior wings fusco-hyaline.

Male: Superior anal appendages laminated, the apex incurved. Length 14 millim.; alar expanse 26 millim.

Labrador.

Gen. HALLESUS. Stephens.

H. HOSTIS, *Hagen.*—Luteo-rufous, with luteous hair; antennae stout, luteous; thorax on each side above rufo-fuscous; feet luteous, with black spines; apex of the wings broader, pale luteo-hyaline, hardly with luteous hairs; subrugulose, base at the anal angle, and the third apical vein fuscous; a large oblique paler spot upon the middle; veins luteous; posterior wings luteo-hyaline.

Male: Posterior appendages short, luteous, ovate, adpressed; the intermediate ones longer, straight, conical, fuscous. Length 20 millim.; alar expanse 36 millim.

N. Red River, Rupert's Land; Northern Illinois.

H. GUTTIFER, *Walker.*—Testaceous; antennae ferruginous; anterior wings tuberculose, with an obsolete subfuscous spot in the apical areolets, another at the thyridium, and a black dot in the third apical areolets, posterior wings whitish; feet and palpi testaceous.

Male: The fuscous spots of the anterior wings sometimes obsolete. Length 20 millim.; alar expanse 36-42 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston), Georgia (Abbott), New Orleans.

H. MUTATUS, *Hagen.*—Fuscous, with fuscous hair; antennae brown, annulated with luteous; feet yellowish, with black spines, base of the tibiae as well as the middle and apex marked with fuscous; wings fuscous, finely tuberculated, closely guttated with pale; a semicircular stripe at the anastomosis apically, and a discoidal irregular spot, pale hyaline; veins fuscous; posterior wings brownish hyaline. Length 15 millim.; alar expanse 29 millim.

Labrador.

Gen. ENOICYLA. Rambur.

E. AREOLATA, *Walker.*—Black-gray, with black hair; femora obscure ferruginous; anterior wings whitish, with black veins, many of the areoles with fuscous bands, the apical ones with broader bands; margins ciliated. Length 7 millim.; alar expanse 13 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

E. INTEROISA, *Walker.*—Fuscous with white hair; antennae fuscous annulated with luteous; feet luteous, with black spines; spurs short; anterior wings long, narrow, fuscous, subtuberculose, with white hair, with a discordal oblique spot, the thyridium and a point at the margin of each apical areole, whitish hyaline; veins lurid; posterior wings grayish hyalime.

Var.: Black, antennae and feet ferruginous; thorax striped with hoary; anterior wings fuscous, irrorate with whitish, with some oblong darker brown and whitish discoidal spots, and with small white spots at the apex; posterior wings grayish. Length 18 millim.; alar expanse 34 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

E. DIFFICILIS, *Walker.*—Testaceous with pale hair; antennae fuscous, the two basal joints entirely and the base of the following ones testaceous; anterior wings subtestaceous, closely but indistinctly irrorated with hyaline, spots often confluent, veins ferruginous; posterior wings hyaline. Length 15 millim.; alar expanse 28 millim.

Nova Scotia.

E. DESIGNATA, *Walker.*—Fuscous with luteous hair; antennae lurid; thorax above bivittated with lurid; abdomen luteous beneath;

feet yellow, with black spines, spurs long, luteous; anterior wings luteous, almost shining, with a longitudinal stripe which is broader towards the apex, and margined with fuscous; veins luteous; posterior wings luteo-hyaline. Length 18 millim.; alar expanse 34 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston), Nova Scotia, Arctic America.

Gen. APATANIA. Kolenati

A. NIGRA, *Walker.*—Black, with black pile; beneath, a little clothed with luteous hair; antennae rather short; breast grayish; apices of the abdominal segments, base of the tarsi, and tibiae ferruginous; wings blackish, clothed with black pile. Length 9 millim; alar expanse 16 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

A. PALLIDA, *Hagen.*—Black, with luteous pile; antennae black; feet pale, with black spines, femora fuscous; anterior wings luteo-hyaline, and the veins of the same colour, with luteous pile and cilia; posterior wings hyaline. Length 8 millim; alar expanse 15 millim.

St. Lawrence River.

Subfam. SERICOSTOMINA.

Species of Sericostoma (Latreille) are found in the Southern United States, but are scarcely to be expected in Canada.

Gen. NOTIDOBIA. Stephens.

N. BOREALIS, *Hagen.*—Brownish-black, with luteous hair; antennae bright yellow, the last joint and the palpi black, hairy; feet pale, whitish; wings fusco-hyaline, the anterior wings densely covered with luteous hair and ciliated with luteous. Length 7 millim.; alar expanse, 13 millim.

St. Lawrence River; Washington.

Gen. BRACHYCENTRUS. *Curtis.*

B. FULIGINOSUS, *Walker.*—Black, with hoary hair; antennae long, ferruginous; apices of the abdominal segments and the legs testaceous; palpi testaceous, with the apex blackish; the anterior wings grayish-fuscous, veins ferruginous; posterior wings cinereous. Length 14 millim.: alar expanse 26 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

Gen. Mormonia. Stephens.

M. togata, *Hagen.*—Brownish-gray, with luteous hair; antennae pilose, pale yellow, annulated with fuscous, the basal joint long, brownish-gray, hairy; palpi and feet pale; abdomen fuscous; anterior wings narrow, fuscous with luteous hair, veins fuscous, with fuscous pile; posterior wings cinereous. Length 9 millim; alar expanse 16 millim.

St. Lawrence River; Washington.

Gen. Hydroptila. Dalman.

H. tenebrosa, *Walker.*—Blackish; antennae fuscous, the basal joint larger, ovate; feet testaceous; wings blackish-gray, ciliated, with black veins. Length 4 millim; alar expanse 6 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

H. albicornis, *Hagen.*—Gray; antennae stout, snow-white, with the middle and apex fuscous; palpi whitish; head with snow-white hair, the vertex with fuscous hair; thorax fuscous; feet whitish, the posterior ones ciliated with white; anterior wings greyish-fuscous, ciliated with gray, the margin and disk pointed with snow-white; posterior wings gray, clothed and ciliated with gray hair. Length 3½ millim.; alar expanse 6 millim.

St. Lawrence River, Canada.

H. tarsalis, *Hagen.*—Gray; antennae somewhat robust, rather long, fuscous with gray hair; palpi black, the apex snow-white; head black, the vertex white; thorax fuscous: feet whitish, anterior tibiae, spurs, and tarsi fuscous, the latter annulated with white; posterior feet with gray cilia; anterior wings fuscous, the anterior margin black, ciliated with gray, and pointed with snow-white; posterior wings with gray hairs and cilia. Length 3 millim.; alar expanse 5½ millim.

St. Lawrence River, Canada.

The specimen described of the preceding being a female, of this a male, from the agreement in size and locality, and in several characters, Hagen not improbably suggests that these may be the two sexes of one species.

Subfam. Leptocerina.

Gen. Molanna. Curtis.

M. cinerea, *Hagen.*—Ferruginous, sparingly clothed with gray hair; antennae stout, ferruginous; anterior feet ferruginous, the four posterior gray, the tarsi with black spines; wings narrow, gray, clothed with gray hair, the apex obsoletely marmorated with fuscous; posterior wings gray. Length 12 millim.; alar expanse 23 millim.

St. Lawrence River, Canada.

M. RUFA, *Hagen*.—Rufo-fuscous, with fuscous hair; antennae and palpi rufous; feet testaceous, the anterior ones and femora rufous; abdomen fuscous; wings fuscous, with rufous hair, posterior wings fuscous, veins fuscous. Length 10 millim.; alar expanse 18 millim.

Trenton Falls, N. Y.

Gen. LEPTOCERUS. Leach.

L. LUGENS, *Hagen*.—Fuscous; antennae black, the basal half annulated with snow-white; palpi fuscous; head with snow-white hair; feet snow-white, base of the femora fuscous, the four anterior tarsi spotted with fuscous; anterior wings rufo-fuscous, with fuscous hair, and luteous intermixed, a whitish-yellow spot at the anal angle; veins fuscous; cilia paler; posterior wings gray. Length 11 millim.; alar expanse 21 millim.

St. Lawrence River, Canada.

L. DILUTUS, *Hagen*.—Grayish-fuscous; antennae fuscous, the basal half broadly annulated with snow-white; palpi fuscous, with snow-white hair; head with snow-white hair; feet snow-white, bases of the femora a little obscured; abdomen fuscous; anterior wings gray, with luteous hair, sometimes obsoletely varied with fuscous; veins gray; cilia fuscous, with an anal yellowish spot; posterior wings gray. Length 7-10 millim.; alar expanse 13-19 millim.

Chicago.

L. NIGER (*Phrygania nigra, Linn.*)—Black, shining, with black hair; antennae black, the basal half annulated with snow-white, the basal joint rufous; head black, shining; palpi very densely black hirsute; abdomen black; feet luteous, intermediate ones snow-white; tarsi spotted with fuscous; anterior wings steel-blue black, posterior wings blackish. Length 7½ millim.; alar expanse 14 millim.

Washington; Europe, widely distributed.

L. SEPULCHRALIS, *Walker*.—Black, with black hair; antennae black, the base annulated with white; apex of the abdomen ferruginous; feet testaceous; wings blackish. Length 8 millim.; alar expanse 13 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

L. VARIEGATUS, *Hagen.*—Luteo-fuscous, with snow-white hair; antennae luteo-fuscous, the basal half annulated with snow-white, the basal joint luteo-fuscous; palpi fuscous, with gray hair; head fuscous, sparingly clothed with white hair; feet gray, tarsi snow-white, spotted with fuscous; anterior wings grayish fuscous, with brown and gray hair, spotted with gray especially at the apex, margin, and angle; veins stout fuscous; posterior wings cinereous. Length 14 millim.; alar expanse 27 millim.

Chicago.

L. SUBMACULA, *Walker.* 4Black, with black hair; antennae very long; palpi hairy; tibiae and tarsi testaceous; wings cinereous, the anterior sprinkled with white, and with three whitish spots, the one basal, the second discoidal 'subcostal, and the third anal; veins black. Length 14 millim.; alar expanse 25 millim.

St. Lawrence River, Canada.

L. MENTIENS, *Walker.*—Ferruginous, hairy; antennae black, annulated with white; palpi hairy; tarsi banded with white; anterior wings cinereo-fuscous, with ferruginous pubescence, veins ferruginous; posterior wings cinereous. Length 10 millim.; alar expanse 19 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

L. INCERTUS, *Walker.*—Obscure testaceous, with golden hair, and more scarce black pile; beneath whitish; antennae very long, whitish; palpi hairy; apex of the abdomen ferruginous; feet whitish; wings cinereous, the anterior with golden pubescence. Length 7 millim.; alar expanse 12 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

L. INDECISUS, *Walker.*—Black, with black hair; feet ferruginous; antennae very long, palpi very hairy; wings blackish, the anterior with fuscous pubescence. Length 11 millim.; alar expanse 21 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

Gen. SETODES. Rambur.

S. EXQUISITA, *Walker.*—Pale yellow, with snow-white hair; antennae luteous, the lower part annulated with fuscous, the basal joint yellow, with snow-white hair; head and thorax yellow, with snow white hair; palpi and abdomen yellow; feet snow-white; anterior wings snow-white, with some transverse luteous bands, the apical ones maculose, imperfect; at the apex of the posterior margin are four black spots and some obsolete black streaks; posterior wings snow-white. Length 8-13 millim.; alar expanse 15-25 millim.

St. Lawrence River, Canada; Washington; Georgia.

S. NIVEA, *Hagen.*—Brownish-black, with snow-white hair; antennae snow-white, the lower part annulated with fuscous, the basal joint yellow, with snow-white hair; head yellow, the disk brownish-black, with snow-white hair; thorax brownish-black, with snow-white hair; palpi and feet pale; abdomen luteous; anterior wings snow-white, with fuscous veins, at the apex transversely obsoletely clouded; posterior wings snow-white. Length 15 millim.; alar expanse 28 millim.

St. Lawrence River, Canada.

S. RESURGENS, *Walker.*—Fuscous with whitish hair; palpi and feet fulvous, sprinkled with whitish hair; anterior wings fuscous, with white spots at the base and at the disk and apex of the apical areoles; posterior wings cinereous. Length 16 millim.; alar expanse 30 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

S. ALBIDA, *Walker.*—Fuscous, with whitish hair; lower part of the antennae annulated with white; palpi testaceous; feet whitish; wings whitish, with testaceous veins. Length 13 millim.; alar expanse 25 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

S. INJUSTA, *Hagen.*—Luteous, with luteous hair; antennae luteous, subannulated with fuscous; palpi with luteo-fuscous pile; feet and abdomen pale luteous; anterior wings luteous, with ochreous pile and cilia, the anterior margin a little obscurer at the base; the anal angle a little fuscous and ciliated with fuscous hair; posterior wings luteous, with pale cilia. Length 12 millim.; alar expanse 23 millim.

St. Lawrence River, Canada; Chicago.

S. IMMOBILIS, *Hagen.*—Fuscous with luteous hair; antennae fuscous, the basal joint luteous; palpi with fuscous hair; head and thorax fuscous; feet luteous; abdomen fusco-luteous; anterior wings fuscous, with luteous hair, the margin obsoletely spotted with fuscous, ciliated with fuscous; posterior wings brown-gray, with gray cilia. Length 7 millim.; alar expanse 13 millim.

St. Lawrence River, Canada.

Subfam. HYDROPSYCHINA.

Gen. MACRONEMA Pictet.

M. ZEBRATUM, *Hagen*.—Brassy-fuscous, spotted with yellow; antennae black; head, thorax, and abdomen brassy-fuscous; palpi yellow; feet yellow, the anterior tibiae and base of the femora a little infuscated; posterior tibiae with long yellow spines; anterior wings subnude, yellow, with longitudinal stripes at the base, and transverse ones on the disk fuscous; the apex fuscous, with an orbicular yellow spot; posterior wings cinereous, the anterior margin and pterostigma yellow.

Var.: Anterior wings less spotted, the basal stripes shorter, the disk spotted, and the apex with an incurved band, which has the open side inwards, fuscous.

St. Lawrence River, Canada; Niagara Falls; Maryland; Virginia; Washington.

Gen. HYDROPSYCHE, Pictet.

H. SCALARIS, *Hagen*.—Black-gray, with white hair; antennae luteous, the lower part obliquely striated with black, the first joint with snow-white hair; head grayish-fuscous, with snow-white hair; thorax grayish-fuscous, with a broad medial stripe of white hair; the eyes of the male larger, approximated; palpi luteo-fuscous; abdomen fuscous; feet pale luteous; anterior wings blackish-gray, densely flecked with white; veins black; posterior wings cinereous, luteous at the base. Length 13 millim.; alar expanse, 25 millim.

St. Lawrence River, Canada; Washington.

H. MOROSA, *Hagen*.—Luteo-fuscous, with luteous hair; antennae luteous yellow, annulated with fuscous; head and thorax luteo-fuscous, with luteous hair; feet luteous; abdomen fuscous; anterior wings luteo-fuscous, densely guttated with luteous; veins luteo-fuscous; posterior wings luteo-cinereous. Length 10-13 millim.; alar expanse 19-25 millim.

St. Lawrence River, Canada; N. Red River, Rupert's Land; Trenton Falls, N. Y.; Washington.

H. PHALERATA, *Hagen*.—Fuscous, with luteous hair; antennae fuscous, annulated with luteous; palpi and feet luteous; head and thorax fuscous, with luteous hair; anterior wings fuscous, guttated with luteous, with larger spots at the base, pterostigma, and anal angle; veins fuscous; posterior wings blackish gray. Length 7-10 millim.; alar expanse 13-19 millim.

St. Lawrence River, Canada; Pennsylvania; Washington.

H. ALTERNANS, *Walker*.—Black, with hoary hair; base of the antennae fulvous, as well as the feet and apices of the abdominal segments; anterior wings fuscous, closely irrorated with hoary; posterior wings cinereous. Length 12 millim.; alar expanse 23 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

H. INDECISA, *Walker*.—Blackish, beneath testaceous; antennae testaceous, annulated with fuscous; palpi testaceous, fulvous at the base; feet testaceous; anterior wings cinereous, closely guttated with yellow. Length 12 millim.; alar expanse 23 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Nova Scotia.

H. MACULICORNIS, *Walker*.—Blackish, hairy; antennae testaceous, annulated with fuscous; palpi pale; pectus ferruginous; feet testaceous; anterior wings fusco-cinereous, with obsolete irrorations; posterior wings cinereous. Length 8 millim; alar expanse 15 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

H. CHLOROTICA, *Hagen*.—Pale ochreous, with ochreous hair; antennae ochreous at the base, annulated with fuscous, and fuscous at the apex; palpi fuscous; feet luteous; head and thorax luteo-fuscous, with luteous hair; abdomen luteous; anterior wings ochreous, the anal angle and apical margin ciliated with fuscous; posterior wings cinereous. Length 10-12 millim.; alar expanse 19-23 millim.

St. Lawrence River, Canada; N. Red River, Rupert's Land; Chicago; Trenton Falls, N. Y.

H. SORDIDA, *Hagen*.—Blackish fuscous; antennae and palpi fuscous; head and thorax blackish fuscous, with luteous hair; feet luteo-fuscous, femora fuscous; anterior wings blackish fuscous, with fuscous hair; posterior wings blackish. Length 8 millim.; alar expanse 15 millim.

St. Lawrence River, Canada; Washington.

Gen. PHILOPOTAMUS. Leach.

P. DISTINCTUS, *Walker*.—Black, with black and yellow hair; antennae much longer than the body; palpi and feet testaceous; anterior wings brownish-gray, closely guttated with yellow. Length 6 millim.; alar expanse 11 millim.

Trenton Falls, N. Y.

Gen. POLYCENTROPUS. Curtis.

POL. INVARIUS, *Walker*.—Fulvous, with golden hair; vertex and disk of the thorax black; antennae black, the base fulvous; feet testaceous; anterior wings subfuscous, with ferruginous veins; posterior wings cinereous. Length 9 millim.; alar expanse 16 millim.

Nova Scotia.

POL. CREPUSCULARIS, *Walker*.—Black, with luteous hair; antennae testaceous, obsoletely annulated with fuscous, black at the apex; apices of the abdominal segments and legs testaceous; wings cinereous, the anterior with testaceous pubescence, veins fulvous. Length 9 millim.; alar expanse 16 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

POL. CINEREUS, *Hagen*.—Fuscous, with fuscous and whitish hair; antennae fuscous, annulated with white; palpi luteous; head with white hair, occiput with fuscous hair at each side; disk of the thorax with white hair; feet luteo-fuscous, the femora luteous; abdomen fuscous, pale beneath; anterior wings fuscous, with fuscous veins, and closely guttated with white; posterior wings blackish-gray, ciliated with black. Length 8-10 millim.; alar expanse 15-19 millim.

St. Lawrence River, Canada.

Gen. PSYCOMYIA. Latreille.

PS. FLAVIDA, *Hagen*.—Yellow, with ochreous hair; antennae whitish, with obsolete annulations; palpi and feet whitish; head and thorax luteous; anterior wings yellow, with dense ochreous hair and cilia; posterior wings cinereous, acute, with cinereous hair. Length 5 millim.; alar expanse 9 millim.

St. Lawrence River, Canada; Washington.

Gen. TINODES. Stephens.

T. LIVIDA, *Hagen*.—Luteous, with gray hair; antennae luteous; palpi luteo-fuscous; feet pale, the anterior ones luteous; head and thorax luteo-fuscous, with luteous hair; anterior wings gray, with gray hair and an anal luteous spot; posterior wings grayish hyaline. Length 8 millim.; alar expanse 15 millim.

St. Lawrence River, Canada.

Subfam. RHYACOPHILINA.

Gen. RHYACOPHILA. Pictet.

R. FUSCULA, *Walker*.—Ferruginous, partly with black hair, testaceous beneath; thorax with a subfuscous spot on each side; feet testaceous, apex of the anterior tibiae fuscous; wings cinereous, the anterior ones irrorated with whitish, and with many marginal guttae. Length 13 millim.; alar expanse 25 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

R. TORVA, *Hagen*.—Rufo-fuscous; antennae and palpi rufo-fuscous; head and thorax brownish-black; feet testaceous; abdomen luteous; wings fusco-hyaline, with fuscous veins; anterior ones with dense luteous guttae. Length 10 millim.; alar expanse 19 millim.

Trenton Falls, N. Y.; Washington.

Gen. BERAEA. Stephens.

B. MACULATA, *Hagen*.—Black, with black hair; antennae yellow, the base, middle, and apex blackish-fuscous; feet whitish, annulated with black; abdomen pale beneath; anterior wings black, with black hair and cilia, with two white, transverse apical lines, and the apex pointed with white, emarginated at the apex; posterior wings black. Length 4 millim.; alar expanse 7½ millim.

St. Lawrence River, Canada.

Gen. CHIMARRHA. Leach.

C. ATERRIMA, *Hagen*.—Deep black, with black hair; body, antennae, palpi, and feet black, the front with hardly hoary hair; anterior wings with black hair. Length 6–8 millim.; alar expanse 11–15 millim.

St. Lawrence River, Canada; Pennsylvania; Washington; Georgia.

C. OBSCURA, *Walker*.—Blackish, with fuscous hair; thorax and abdomen ferruginous; feet testaceous; antennae black; wings brownish-black, ciliated. Length 4½ millim.; alar expanse 8 millim.

St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

All through this family, from the great number of species described and the extent of the range of most of them, we have felt much at a loss which to select; and as our own acquaintance with Canadian species is as yet very limited, we could only judge from general considerations. We give our synopsis as a foundation to work upon, expecting that many species may be added to it, and possibly not a few rejected from it, yet hoping that it may be of use.

A NOTE ON THE ETYMON OF ONTARIO.

BY THE REV. DR. SCADDING.

(Read at a Conversazione at Trinity College, May 23rd, 1862.)

Father Louis Hennepin in his account of a "New Discovery of a vast Country in America, (1679–82) extending above 4000 miles between New France and New Mexico," says, (p. 31, French version,) that among the Iroquois tribes the name *Ontario* has the signification of "Beau Lac," Beautiful Lake; and in another part of his book he says they also call it *Skannadario,* "Fort beau Lac," (p. 42) Skannadario being supposed to be the same name as *Ontario* with a prefix of intensity.

Hennepin's book being not uncommon both in English and French, the statement has been very generally received that the familiar term by which we designate the great sheet of water which forms our southern horizon, signifies "Beautiful Lake." This interpretation did not originate with Hennepin. He probably heard or read of it at Quebec before his visit to the western regions, for we see (p. 63) a similar statement made in Bressani's *Relation Abrégée,* in 1642; and also subsequently in 1663 in a Report of the Baron d'Avangour, a Governor General of Canada, (*Vide* the Colonial History of the State of New York, ix. 16.) We may hence suppose that this interpretation of *Ontario* was the one current at Quebec in Hennepin's time. Still some uncertainty about it is observable, for in a note to an account of De Courcelles' Voyage to Lake Ontario in 1671, the writer professes to explain the term in question as signifying "The

Great Lake"—from the Huron *Iontare* lake and *io* great. While more recently, Schoolcraft (vol. v. 594) has stated that the original appellation of the Lake was *Onontario*, which he conjectures to be compounded of *io*, an exclamation of surprise or delight, *onon* hills, and *dar* rocks. The precise applicability of the epithet thus interpreted is not manifest. The form of the word is also otherwise varied. On a "Plan of the Early Forts on the Richelieu River," given in vol. iii. of the *Relation des Jesuites* it is given as *Ondiara*, and in the "Documentary History of the State of New York," (v. 709) it figures as *Untarie*.

Ontario, outspread in silvery calm, as we often see it, or when reflecting back from its "unnumbered dimples" the pure azure of the heavens, is doubtless beautiful; but so are all our lakes, under similar circumstances. Hence the name, as commonly understood, does not seem to be sufficiently distinctive. Certainly it is not impossible that a word in the Huron and Iroquois dialect, expressive of beauty generally, may have been caught up by some early French explorer, and applied erroneously as a proper name. For popular and poetic purposes "Beautiful Lake" answers well enough; but I think we shall see directly, that a truer and better account of the appellation may be given.

Before proceeding to explain, it may not be uninteresting to mention that our Lake has borne a variety of names. In an "Account of Encroachments of the English on the Territories of New France, 1699," (*Vide* Doct. Hist. N.Y., ix. 702,) it is called the "Lake of the Iroquois." And so also in the Plan of Early Forts above referred to. It has also been called, no doubt locally, Lake Cataraqui, Lake Oswego, (this is said to be the Iroquois appellation) and Lake Neageh. Governor Dongan, of New York, in a communication to Mons. de la Barre, in 1683, styles it, for convenience probably, the Lake of Canada. Once it was known as Lake Frontenac, in honour of the Count de Frontenac, a distinguished Governor General of Canada in 1672, from whom the Fort which formed the original nucleus of Kingston was named, and from whom the County in which Kingston is situated, is still named. On Hennepin's map it is marked "Lac Ontario ou de Frontenac." It has also borne the name of St. Louis; it is so designated in Champlain's map, 1632; and in the map accompanying the *Historia Canadensis*, by the Jesuit du Creux, 1662. In this last mentioned map (which may be seen in Bressani's

"Abridged Narrative of the Jesuit Missions in New France," published in Montreal in 1852,) our Lake figures as *Lacus Ontarius seu S. Ludovici.* But then, in a "Chorographia Regionum Huronum" on a larger scale, given in the corner of the same map, the name appears as *Lacus*—not *Ontarius*—but *Ouentaronius*—a circumstance to which in a few moments I shall draw your especial attention, inasmuch as, I think, we have here a clue to a more legitimate mode of accounting for the word *Ontario* than any of those that have already been described.

Our Lakes generally, have received appellations from tribes inhabiting their borders.

Erie is an aboriginal name curtailed and disguised. The French maps give it as *Erié,* with an accent, (said to be softened from *Erigé* or *Eriké,*) and they interpret it to mean *Lac du Chat,* "Cat Lake," from a tribe which speedily disappeared, at least, under that designation, whose totem probably was the lynx or wild cat, or who may thus have been nicknamed by their enemies. In du Creux's map it is *Lacus Erius seu Felis.* So in Hennepin's map it is *Lac Erié ou du Chat.* This appears to have been the Huron name; whilst among the Iroquois it was known as the Lake of the *Tejocharontiong,* (Hennepin) or *Techaronkion,* (de Courcelles.) In Champlain's map Lake Erie does not appear: a rather broad stream connecting Lakes Huron and Ontario occupies its place. In Lewis Morgan's Aboriginal Map (1851) the Lake is marked *Doshoweh Tecarneodi,* evidently a local appellation from *Doshoweh* the name of the entrance to Buffalo Creek, where the city of Buffalo now stands. This Doshoweh is stated by Morgan to mean "Splitting the Fork," although earlier writers, giving the word *Deoseowa,* (Seneca) or *Tehoseroro,* (Mohawk) educe from it the more elegant signification of "Place of the Linden or Basswood tree."

Lake Michigan retains an aboriginal name, having the vague signification of "Great Lake." Hennepin, however, informs us that it possessed also the more distinctive appellation of "Lac des Illinois," derived from the neighboring native tribes. And "Illinois," he assures us, signifies—like the ancient German Teutones,—"people," braves, perhaps, or heroes; so that du Creux, in his Latin map, instead of naming this lake *Magnus Lacus Algonquinorum* as he does, might have termed it *Magnus Lacus Virorum.* (*Algonquinorum* seems to be an error, as the Algonquins, *i.e.*, the Objibwas, &c., were situated farther to the North and West.)

Lake Huron means the "Lake of the Hurons," as it figures on du Creux's map—*Mare Dulce seu Lacus Huronum.* *Mare Dulce* is evidently the designation given to this lake by Champlain, who, struck by the purity and excellence and vast volume of its waters, called it Mer Douce; while *Huronum* reminds us of one of the mongrel Latinized appellations to be met with in Tacitus; for under an aboriginal guise and sound the term "Huron" is in fact French, being simply a sobriquet for the Wyandots,—derived from "Hure," as Bressani and Hennepin rightly say—and "Hure," Boyer informs us, is a term applied to a *tête d' un sanglier, d' un ours, d' un brochet,* (a great Pike); also he gives it as a coarse term for a *tête mal peignée, cheveux rudes, et mal en ordre.* The Wyandots living on the eastern borders of this lake, were accustomed, it appears, by way of ornament to singe their hair until their heads had the bristly, unkempt aspect of those prefixed to wild boars. Hence the French jestingly applied to them the appellation of "Hurons," Boar-heads, above somewhat amusingly Latinized into *Hurones.* Charlevoix calls this Lake "the Lake of the Attigouotans," (Attigouotan is one of the very varied forms of Wyandot) and Livingston, a United States Secretary for Indian Affairs, in "Observations on a Tour to Onnondaga in 1700," calls it Lake Ottawawa, and Lake Erie, Lake Sweege—examples, again, probably, of local names given to lakes which also bore more general appellations.

Of Lake Superior I do not find given in the maps any specific aboriginal name; but in Baraga's Otchipwe Dictionary I find it named in the usual way from the tribes inhabiting its shores: he styles it *Otchipwe-Kitchigami,* "Sea of the Chippewas." In "Hiawatha," we shall remember, this lake figures as "Gitche-Gumee," conveniently, but not elegantly, translated "Big-sea-water,"—another of those general appellations applicable, and doubtless applied, on certain occasions, to any of the Great Lakes. Here was drowned Chibiabos, the "most-beloved" of Hiawatha: Chibiabos "the sweetest of all singers:"—

> "Unktakee, the god of waters,
> He the god of the Dacotahs,
> Drowned him in the deep abysses
> Of the Lake of Gitche-Gumee." (xv.)

It was probably because this lake was thus haunted, that it was deemed sacred; although, according to the Jesuit Claude Allouez, it may have been for other reasons: "Les Sauvages respectent ce lac comme un Divinité; et lui font des sacrifices, soit à cause de sa grandeur, * * soit à cause de sa bonté, fournissant du poisson, qui nourrit tous ces peuples au defaut de la chasse, qui est rare aux envir--s," (Rel. 1667-8.) We may congratulate ourselves that this lake did not retain the name "Lake Tracy," which was once conferred upon it in honour of the Marquis de Tracy, a Viceroy of Louis XIV., in 1665,—in whose time Mr. F. X. Garneau (History of Canada, i. 216,) informs us, horses were first imported into Canada. Father Claude Allouez speaks of it under this name (anno 1667), and in the map given by Bancroft in his History of the United States (vol. iii. 153), it is marked *Lac Tracy ou Superieur*. Du Creux simply Latinizes it *Lacus Superior*, which, though denoting vaguely the "Upper Lake," has produced the name which has such a grand sound in our ears, in comparison with which "Lake Tracy" seems a kind of bathos, somewhat similar to that which presents itself on the maps in those very unpoetic designations of two conspicuous peaks of the Rocky Mountains—Mount Brown and Mount Hooker. Champlain gives the name of Lake Superior as *Grand Lac*—a literal translation of *Gitche-Gumee*.

I now return to our own lake and its appellation. I have said that it is generally received to mean *Beautiful;* but on comparing the title borne by this lake in several of the old maps with the name of a celebrated aboriginal tribe once inhabiting its southern shore, and bearing in mind the tendency which has evinced itself in other instances to describe lakes by the names of neighboring tribes, it has struck me that another interpretation of Ontario is more probable; and that its supposed signification of "Beautiful"—if that sense can be traced in its composition at all—is perhaps as fanciful as the discovery of ἄορνις *bird-less*, in the Phœnician *Avernus*, indicating in reality, we are told, nothing relating to "birds," but the gloom and darkness characteristic of a volcanic crater.

Du Creux gives, as I have said, *Lacus Ontarius* and *Lacus Ouentaronius*. Now I think this last term *Lacus Ouentaronius* comes the nearest to the name intended to be expressed by Ontario; that it, in fact, contains the original of Ontario.

On the map given by Brodhead in his History of the State of New York, 1609–1664, the name borne by our lake in 1615 was "Lac des

Entouhonorons,"—Lake of the Entouhonorons. Champlain, also, in his account of his Expedition with the Wyandots against the Iroquois, calls it "The Great Lake of the Entouhonorons."

Now who were these? They were one of the celebrated "Five Nations" inhabiting the region between Lake Ontario and the New England States—the well-known league of tribes called by the French "Iroquois,"—not by the satirical use, this time, of a French term, but by the manufacture of a word out of native materials,—from *hiro*, dixi, "I have said," and *koué*, a French effort to express the favorite formula of assent, given more at large in *Hiawatha*, as "hi-au-ha!"

The Entouhonorons are better known to us as the Senecas. How it happened that a portion of the sons of our far western forests came to possess a name identical with that of the Emperor Nero's respectable tutor, used at one time to be a mystery to me; and its solution, when I discovered it, gave me great delight. The origin of the term I found to be this:—the termination *eca*—variously written *eca, aca, aga, equa*,—according to Pownall,—a learned philological Governor, in succession, of New York, Massachusetts, and South Carolina, about a hundred years ago, (1753–1)—denotes a tribe or people: and *sen* has the meaning of *farther*. Hence *Seneca* signifies "the farther nation," without stating their name. In like manner the familiar term *Mohawk* has, according to the same authority, the meaning of "the hither or nearer nation"—the particle *mo* or *ma* having the sense of *hitherward, hithermost*,—the actual name of these *Mo-acs, Mo-ages, Ma-quas*, &c., being *Ka-ying-e-ha-aga*, "the people that are at the head of men,"—a name compressed by the French into *Agniers*. "Hither" and "farther" are here used relatively, of course, to New England.

The real name of the Senecas or "Farther Tribe," as given on the southern or Iroquois side of the lake, was *Nundowauga* or *Nundawaono*, "the-great-hill-people," from a hill at the head of Lake Canandaigua, where was their original settlement, (Morgan, 51.) But on the northern or Wyandot side they were known as the *Entouhonorons*, *Sonnontouans*, &c., terms by which perhaps a similar sense may be conveyed, as we know that in the Algonquin dialect, *Onnontio* = Montmagny = Great Mountain. On Champlain's map the Seneca District is marked as occupied by the *Antouhonorons*, and in du Creux's by the *Ondieronii* and *Sonnonionenii*. In *Ondieronii* we may recognize the Iroquois *Nundawa-ono,*—*ono* and *eronon* in the northern and southern dialects respectively implying "people."

The Wyandots or Hurons, inhabiting the regions where we now find our home—in their hostile expeditions against their hereditary foes and ultimate conquerers, the Five Nations,—had to cross our lake; and the first of these nations upon whom they would descend was this tribe of Entouhonorons, as they would style them. Hence they spoke of the lake which was the highway to the country of their enemies, and which probably at the time bore no general geographical appellation in our sense of the term, as the Lake of the Entouhonorons.

Disguised, then, through the difficulty which the early and generally unphilological European settlers experienced in catching and rendering the exact sounds and syllables of a nasally-pronounced unwritten language, divided into dialects, some admitting, some rejecting, labials and liquids,—do we not see in du Creux's *Lacus Ouentaronius* an effort to express in Latin phrase the "Lake of the Ondierons," as he seems to have caught the sound, (compare his *Ondieronii*) who were plainly the same as the Nundawa-ono, the Sonnontonans, Isonontonans, Antouhonorons, or Entouhonorons? Just as in his *Lacus Erius* he expressed "Lac des Erigés" or "Eriés." And then in this *Ouentaronius,* pronounced according to the French phonetic system, do we not detect *Ontario?* Have we not here a transition-term to that familiar household word?

Then, if so, our lake becomes at once historic in its appellation; it retains within its syllables an interesting memento of by-gone times. and it falls into the category of the other great lakes in respect to nomenclature. As the Upper Lake derived a name from the Ojibwas on its borders, and the next in descending order was designated from the Wyandots or Hurons, the next from the Illinois, and the next from the Erigés or Eriés, so the next was the lake of the distinguished tribe of the Entouhonorons or Senecas.

And if any etymological element seeming to signify "beautiful," has been discovered in "Ontario," by those who have had some acquaintance with the local aboriginal dialects, the coincidence has been most probably accidental—one of those chance literal or syllabic resemblances which are so frequently to be met with in the comparison of languages, and on which it is generally unsafe to build.

ON THE POWER THAT CERTAIN WATER BIRDS POSSESS OF REMAINING PARTIALLY SUBMERGED IN DEEP WATER.

BY BEVERLEY R. MORRIS, M.D.

Read before the Canadian Institute, February 22nd, 1862.

In watching the habits of some of the more aquatic of the water birds, I have often been greatly struck by the remarkable power many of them possess of keeping the body submerged for some time after they have allowed the head and neck to appear, on coming to the surface after a dive caused by fear. As far as my own observations go, birds do not make use of this precautionary measure when entirely undisturbed and ignorant of being watched: on such occasions, I believe, they always come up at once completely, and without any but the necessary interval between the emergence of the head and the upper part of the body. After having noticed this curious and self-preservative power once, it was impossible that I should not speculate as to the mode in which the bird accomplished this singular but most useful manœuvre.

In watching sea birds, such as the Cormorant, the larger divers, and the Guillemot, I have often seen them, when emerging from a dive caused by fear, project the head and neck first out of the water, the body remaining completely out of sight; the bird then looks round to see if any danger is near; if it is not satisfied with the appearance of things, it is under water in an instant, and probably does not come up again till at a considerable distance. Should, however, all be secure, after a few seconds it allows the usual portion of the body to appear, and this is evidently dependent on the will of the bird. On other occasions, when not much alarmed, instead of again diving it will allow the body to be slightly emerged, and continue swimming for some time in this state of partial submergence—like a deeply laden ship. To show how completely the position of the bird in the water, as to submergence, entire or partial, is under its own control, I will give one or two short extracts from the "American Birds" of the talented Audubon. In speaking of the *Plotus anhinga*, or Snake bird, he says:—"The anhinga is in truth the very first of all fresh-water divers. With the quickness of thought it disappears beneath the surface, and that so as scarcely to leave a ripple on the spot; and when your anxious eyes seek around for the bird, you are astonished to find it many hundred yards distant, the head, perhaps, merely above the water for a moment; or you may chance to perceive the bill alone, gently cutting the water, and producing a line of wake, not observable beyond the distance of thirty yards from where you are standing. With habits like these it easily eludes all your efforts to obtain it." In speaking of the Purple Gallinule (*Gallinula Martinica*) he says:—"It runs with great speed, and dives with equal address—often moving off under water with nothing but the bill above." Again, he says of the Common Moorhen (*G. Chloropus*):—"At all other times, when raised, they suffer their legs to dangle, proceed slowly to a short distance and drop among the reeds; or if over water, they dive and hide, leaving nothing but the bill projecting above the surface." One more and I have done. The Clapper Rail (*Rallus crepitans*):—"It dives well, remains a considerable time under water, and in this manner dexterously eludes its pursuers. When hard pressed it often sinks just below the surface, keeping the bill above in order to breathe, and in this position, if not detected, remains for a considerable time; if perceived and approached, it instantly dives, and uses its wings to accelerate its progress, but rises as soon as it comes to a place of safety." These extracts all show a wonderful power of control over their specific gravity in birds, which are, except the first, only moderately aquatic in their habits and conformation, and which one would hardly expect to exhibit the highest developement of diving powers.

Before entering on the mode in which the bird accomplishes this state of submergence, it may be well to remark that birds, in addition to the air contained in their lungs, are also furnished with large cavities called air cells, in every part of the body, where they do not interfere with the organization of the part. These air cells communicate with the lungs, but do not appear to be capable of being emptied of the contained air at the will of the bird. The bones and barrels of the feathers are also full of air, so that the bird is naturally a good deal lighter than water, and cannot sink without some effort on its own part.

I will now proceed to consider the main subject of inquiry, namely, how the bird probably may be supposed to alter its buoyancy to such an extent as to enable it to maintain the whole of its body just beneath the surface of the water. It is manifest to any one who is at all conversant with the laws of hydrostatics, that in *deep water* this can only be accomplished in one of the following ways, by either of which the body of the bird might be supposed to be rendered of, as nearly as possible, the same specific gravity as the water in which it swims :—

1st. The bird might expel so much air from its body as to remove its power of floating on the surface of the water; or,

2nd. It might so compress its body as to condense the air in the various cavities to such an extent as to place it in the required condition.

With regard to the first of these suppositions, namely, that the bird might expel so much air as to remove its power of floating on the surface, although it is considered by some writers on the subject to be a plausible explanation of the phenomenon, I cannot think that it is the true one; for, in the first place, we have no evidence that the bird has any power, as to expulsion at least, over the air in the various air cells, which constitute the great bulk of the air vessels contained in its body. Indeed the general impression among anatomists is that it has no power at all over it; and, even if it had, I cannot think it would be possible for the bird to expel it so quickly as would be necessary to produce such an immediate effect as does actually take place; nor would the bird have the power of again taking it in so rapidly as it manifestly must do to enable it to float at its ordinary level in so short a time after partial submergence as it in reality does.

In a paper on this subject the Rev. J. C. Atkinson says :—"I will shoot a Moorhen in the act of diving, and will add to its specific gravity by depositing within its body some twenty or thirty grains of No. 5 shot. Of course then it will sink, and unless my retriever is a rather uncommon one I lose the bird. But no such thing; the Moorhen comes to the surface immediately, and floats almost as buoyantly as ever; and yet whence and how can the air have been procured, which has been applied to the replenishing of the air vessels and the restoration of the bird's buoyancy." I will endeavour, when considering the second supposition, to give what I believe to be the true explanation of this fact, for it is only as a fact that it is brought forward by Mr. Atkinson, as being opposed to the idea that the bird expelled the air from its body before submergence, and which was the hypothesis of his opponent, Mr. Slaney. I have very little doubt in my own mind that the muscular system of the bird would enable it so to compress its body as to expel sufficient air to make it of the same specific gravity as water, were the various air cavities so arranged as to allow of free egress and ingress. But, unfortunately for this theory, such is not the case, and I much doubt whether the removal of all the air in the numerous air cells, the bones and feathers, would be possible even under the air pump. Another argument, also, which bears strongly against this idea is, that were the bird to get rid of the air from the air cavities, it could only do so through the lungs, which thus must be in the same condition, and the bird would necessarily become suffocated for want of the quantity of air absolutely essential for respiration, and which the bird can do without worse than any other animal; for its circulation, and consequently its respiration, is very rapid, and it is this which enables it to keep up its natural heat under circumstances that would be fatal to animals otherwise constituted. No; every bird on diving has the power, if it sees reason to exercise it, of arresting its own progress upward, so that it shall at first only shew its head and neck, or only its bill, above water, and it can in this state take in a fresh supply of air, and this, too, in a single second, sufficient to enable it to take a long dive before again coming up, as every one must often have observed. How would it be possible for the bird to perform all this if it had gone down with such a reduced quantity of air as must have been the case had this been the mode of accomplishing its purpose.

I will now dismiss this hypothesis and proceed to consider the second mode.

2nd. It might so compress its body as to condense the air in the various cavities to such an extent as to place it in the required condition.

It is a well known fact that if you condense a cubic foot of air into a vessel already containing another cubic foot under the ordinary atmospheric pressure, you do not increase the buoyancy of the vessel in water by the additional quantity of air, but the contrary—you lessen it, and make it sustain less weight in the water by somewhere about 535 grains. Now, I cannot help thinking that here we have the true solution of the difficulty in question. No one, I imagine, will deny that if the bird has the power of compressing itself to a sufficient extent, it must sink instead of swim. Let us now see whether it would be possible for a bird to compress itself to such an extent as to be in the condition of the vessel with the two cubic feet of air. To establish this point, I will again quote from Audubon's "American Birds." In speaking of a young bird of the Least Bittern (*Ardea exilis*) which stood on the table while he made a drawing of it, he says, "Replacing it on the table, I took two books and laid them so as to leave before it a passage of an inch and a half, through which it walked with ease. Bringing the books nearer each other, so as to reduce the passage to one inch, I tried the Bittern again, and again it made its way between them without moving either. When dead, its body measured two inches and a quarter across, from which it is apparent that this species, as well as the Gallinules and Rails, is enabled to contract its breadth to an extraordinary degree."

Here it is clear that this bird was somewhat in the condition alluded to, and this, too, without much apparent inconvenience; and I feel convinced the amount of compression which evidently existed in this case would be abundantly sufficient to produce in a Water Bird the difference between floating well out of the water and being merely suspended in it. In another place, Mr. Audubon says of the Virginian Rail (*Rallus Virginianus*): "Like the two preceding species, (*R. elegans* and *crepitans*), the Virginian Rail has the power of contracting its body to enable it to pass with more ease between the stalks of strong grasses and other plants."

Now if these birds have the power of compressing themselves to so great an extent to enable them to move easily in their coverts, is it at all improbable that diving birds should have a similar power, and one that would be of such great value to them in enabling them to preserve themselves in times of danger. But further, when a man attempts to dive, he takes a full inspiration first, and then, when diving, he powerfully exerts all the large muscles round the body, I have little doubt to produce instinctively the same effect that I suppose is produced in the diving bird, namely, to bring the specific gravity of his body nearer to that of the water, and so make the diving easier. Again, Mr. Atkinson said that a Moorhen shot when diving instantly rose to the surface, notwithstanding the lead he had put into it. But why? Simply because, the bird being dead, the act of volition by which it compressed its body was gone, and the contained air instantly assumed its usual bulk, and the bird its usual position. So in the case of any bird diving from fear; it rises to the surface with its body in a state of compression; it at first only allows its head and neck to emerge, but, on looking round and seeing no danger, it suddenly relaxes the effort which it had till then kept up and its body instantly resuming its usual state, the bird as quickly assumes its natural position, and floats buoyantly on the water. Let, however, some slight occurrence disturb it, not enough to make it dive, and it instantly sinks itself deeper into the water, and remains submerged until it finds that all danger has disappeared. It runs no risk of being suffocated, for the condensed air is just as capable of sustaining life as ordinary air, and will do so just as long as a common inspiration. The bird, too, in this compressed state is able to inspire regularly, though of course in a constrained manner.

Let us now take one illustration from another class of Nature's works —I mean the Pearly Nautilus. The shell occupied by this curious animal is of considerable size, but has only a small portion of its cavity filled by the body of the animal. The rest of the shell is composed of cells, with the interior of each of which the animal has a direct communication by means of what is called the siphuncle or tube. These cells, in their natural state, are filled with air or gas of some kind; and it is clear that in this condition the animal must float on the surface of the water, and cannot while in that state sink. But there is a very curious provision to obviate this inconvenience, for as soon as the animal is frightened, or from any other cause contracts its body within the front part of the shell, water is by this very act forced down the tube, and so into all the cells, and thus compressing the air, the buoyancy of the animal is lessened, and it sinks in the water. When the animal wishes to rise it protrudes the head, and this opens the communication between the cells and the external water, and the air expanding forces out the water, and the animal again floats. Here we find an action analagous to that of the bird, produced without the slightest deviation from any of the known laws of Nature. It is true it is executed by a different application of the same principle which I have supposed to be called into action in the case of the bird, but manifestly only so modified on account of the peculiar formation of the animal; I mean from its external covering being rigid. Had it a power of contracting its outward covering, that is, its shell, to one-half its usual bulk, as I have proved the bird to have, it would no doubt exercise it, as the simplest way of producing the desired effect. The water it takes in is manifestly of no use as ballast, for water will not sink in water, and moreover the water at the surface is always warmer than that below, and consequently would rather tend to make it float. Its only use, therefore, must be to compress the air. If it was intended that the bird should use the same means to alter its specific gravity, would it not be provided with some special apparatus, as we see the Nautilus is? No such provision, however, nor the most distant approach to it, exists in the bird; but its external surface is capable of great compression, and is abundantly furnished with powerful muscles, the combined action of which would be to compress the body, and they are under the control of the will of the bird. With the knowledge of all these facts before me, I can come to no other conclusion than that the bird does so compress its body as to condense the air in its various cavities to such an extent as to render the specific gravity of its body about the same as that of the water in which it swims.

REVIEWS.

The Genetic Cycle in Organic Nature; or, the Succession of Forms in the Propagation of Plants and Animals. By George Ogilvie, M.D., Regius Professor of the Institutes of Medicine in the University of Aberdeen; author of "The Master Builder's Plan in the Typical Forms of Animals." Aberdeen: A. Brown & Co. Edinburgh: John Menzies. London: Longman & Co. 1861. Crown 8vo, pp. 296.

In a former volume of this Journal we gave some account of the author's previous work, "The Master Builder's Plan," which is a very pleasing one, fitted for popular use, and perhaps better fitted than any we are acquainted with to give a good general idea of the plan of creation in the animal kingdom. The present volume has been long upon our table, but has always seemed to us to demand more attention than we could at the moment bestow upon it; and though it has interested us much, we must now be content with a slight notice, that we may no longer omit to recommend it to physiological inquirers. If decidedly less fitted for popularity than the former work, it has certainly no less claims on the attention of the real student of Nature, and in proportion to the difficulty and obscurity of the questions involved ought to be the interest excited in attempts at their solution. It may safely be said that candid inquirers will find in Dr. Ogilvie an useful guide, and whatever may be thought of some of his theoretical views, the information brought together is such as could only be collected by the study of many volumes relating to different departments, and some of them difficult of access, whilst the systematic manner in which it is presented greatly enhances its value. In order to give some idea of the work before us we shall first lay before our readers the character and order of the subjects treated, in a list of the titles of the several chapters. We may then select a few particulars for more special notice, without, however, attempting to examine in detail the peculiar views proposed, or to give any opinion respecting them, beyond our conviction that the book deserves the attention of all who pursue physiological studies. The divisions of the subject are as follows:—I. Derivation of Organic Beings. II. Survey of the Reproductive Process in the Vegetable Kingdom. III. Do. in the Animal Kingdom. IV. Nature and Varieties of Alternation of Generations. V. Pullulation. VI. Embryogeny, as representing one Form of Alternation. VII. Representation of the other Forms. VIII. Relations of Ova and Gemmæ. IX. Summary of Conclusions. X. Cases Simulating Alternation of Generations. XI. Homological Relations of the Structures concerned in the Genetic Cycle. There is an appendix of tables exhibiting the order and supposed relations of phenomena in different divisions of organized beings, and there are six illustrative plates, which, though of no great merit in their execution, sufficiently convey the ideas intended, and will be found an assistance by such readers especially as are little familiar with the subjects. The author commences by laying down as the best distinction between organized and inorganic substances the derivation of the former "by a process more or less direct from previously existing individuals of a like kind." In the case of organic bodies, which is thus contrasted with the nearest approaching results of mechanical or chemical agencies, "not only must their ultimate chemical elements be present in some shape or other, but they must be present as combined by the prior operation of the living powers of individuals of a like kind into fertilized germs or other reproductive bodies. If such a germ or reproductive body has been normally constituted, then, and then only, will the application of certain appropriate influences of light heat, chemical action, &c.,

become the means of its being developed into a body eventually resembling that from which it was itself derived."

This is cautiously expressed so as to include all the varieties ever supposed of parental derivation, whilst entirely excluding what has been called equivocal generation; and the paragraph is immediately followed by a candid statement of difficulties raised on that subject, tending to justify the opinion generally prevalent among physiologists unfavourable to the possibility of the origination of organic beings *de novo*. A large portion of the volume is occupied by a survey of the reproductive system, first in the vegetable then in the animal kingdom. This portion of the work is very valuable to a student, and appears to be a careful summary of ascertained facts, although in some instances already, in the short interval since this account was prepared, the field of knowledge has been enlarged. Since the publication of the volumes of Agassiz on the Acalephæ, we can hardly accept as satisfactory the account here given of the Hydrozoa, and other points are more or less questionable, yet we could refer to no better abstract of information on the subject, especially in so accessible a form.

The chapter on "the Nature and Varieties of Alternation of Generations," is both remarkably interesting in itself and important in its bearing on the author's theoretic views. We make a somewhat extended extract in order to bring the latter before our readers—whilst for the facts we refer them to his own pages.

§ 1. The two modes of propagation—by gemmæ capable of spontaneous evolution, and by germs dependent on impregnation—as has been already observed, are frequently associated with no less remarkable diversities in the immediate result of the development, leading in cases of periodic recurrence or alternation of the former, to a corresponding mutation or alternation of dissimilar forms in the same species. It is only, however, quite recently that this has been admitted generally by zoologists, who were not unnaturally indisposed to it, by observing the constant succession of like to like in the higher animals. But since the time that Chamisso called the attention of naturalists to the recurrence of two forms in *Salpa*, as a case of "Alternation of Generations," analogous phenomena have been abundantly brought forward in other tribes of organized beings. Steenstrup was the first to group together these cases, applying to them the same term as was used by the former naturalist, for which some later writers would substitute that of *Metagenesis*, proposed originally by Professor Owen.

In all these cases we may admit so much as this in common—that an act of digenesis recurs with greater regularity in the interval of the acts of monogenesis;

and that the products of the former differ more or less in their conformation from the organisms budded off in the latter.

Hence, as both forms must be taken into account to complete our idea of the perfection of the species, it has been proposed to term them zooids in the case of animals, and phytoids in that of plants, as indicating that any one of them is not so much a complete animal or plant in itself, as a fragment or fractional part of one—the whole series, considered as a specific unit, rather than any one among the successive links of which it is made up, answering to our idea of individual completeness, as this is drawn from the higher animals, in which like seems always to produce like.

In confirmation of such a view, it is noticed that in not a few cases these fractional phytoids and zooids really remain in organic union for life—making up an arborescent form—like what we call a polypidom in animals, which is readily recognized as being in its entireness the individual representative of the species.

* * * * * * * * * *

Though we may allow so much in common in these cases of "alternation," as is involved in the occurrence in all of a periodic diversity of derived forms, there are yet—as was pointed out in the introductory chapter—great variations among them, as far as the relations are concerned in which the budding process stands to the sexual act, and to the full development of the specific type—relations depending on the period of the life-history of the species, at which the act of gemmation is interpolated in the genetic cycle. The contrast lies especially between the cases in which the alternation of form is due to zooids being budded off in the *Protomorphic* stage of the life-history—that is, during the early progress of germinal development—and those in which it arises from the detachment of gemmæ in the fully developed or typical phase, as a preliminary step so the evolution of reproductive organs—the latter zooids belonging to the *Gamomorphic* stage, or that of sexual maturation. The two classes—as has been already observed—differ widely in their structure and relations. In the one case they are the primary products of impregnation, precursors of the perfect form, and without sexual characters—in the other derivative, and with distinct sex. Zooids of both kinds, indeed, may have certain organs superadded, varying in their nature and completeness with the circumstances of their life as independent beings. In those of the protomorphic stage, the adventitious organization probably does not go beyond the development, externally, of cilia, or of a contractile integument for locomotion, and internally, of a rudimentary digestive apparatus; but in many gamomorphic zooids, both the locomotive and alimentary systems may be rather highly organized, and the whole structure occasionally larger and more complex and elaborate than that of the parent stock. On the other hand, such is the structural degradation of some zooids of both kinds, that they might readily pass for mere proliferous cysts or egg-sacs. This variability in the kind and extent of organization proves of itself its adventitious nature, and shows it to be of no value as a distinctive feature. The real points of distinction are those before referred to—their position in the genetic cycle, and their gemmiparous or sexual character in consequence. They both, however, have this in common, that the great end of their existence is the multiplication of the race—an end to which the nutritive and animal functions are always subordinated.

We now pass to the fourth chapter, whence we must quote a passage explanatory of the most recent speculation on the origin of "double monsters."

A single ovum has been observed to originate two distinct axes of embryonic growth. Cases of a double primitive trace of organization have been met with in the bird's egg, by Dr. Allen Thomson and others, and it is probably in some such way that we may most feasibly account for the origin of what are termed "double monsters."* At all events we have in these, as much as in the best marked cases of alternation of generations, a production of two more or less typical organisms from a single original germ; for it is now generally agreed that such monstrosities cannot be well explained on any supposition of the fusion of two independent embryos.

This conclusion rests principally on the following considerations:—

1. In all such monsters the duplicated parts are connected together, and derive their vessels from a common trunk; we never find a face springing out of the chest, legs implanted on the head, or any such mal-position of parts.

2. Double monsters form a continuous series, in which the degrees and modes of deviation from singleness gradually increase, and pass, without any abrupt steps, from the addition of a single ill-developed limb to the nearly complete formation of two perfect beings; so that no theory can be tenable that will not account for the simpler as well as the more complete instances of duplicity—that cannot explain, for example, the existence of superfluous limbs. As M. Vrolik remarks, "the limbs are mere off-shoots, and are produced at so late a period, that if we could imagine two embryos to come in contact by their shoulders or pelvis, and a fusion of those parts to take place, we should still have to explain how one of them, leaving only an arm or a leg behind him, could for the rest of his substance, head, trunk, and all, wholly disappear."

3. The two monsters are always of the same sex, which we know, from the case of twins, is very far from being a constant rule with associated embryos.

The theory of the furcation of a germ or embryo, originally single, is farther supported by an observation of Valentin's, that an injury inflicted on the caudal extremity of an embryo on the second day was found on the fifth to have produced the rudiments of a double pelvis and four inferior extremities.†

Reference may be made also to the observations on the development of the ova of fishes by M. Lereboullet, according to whom, in particular species—as the Pike—the formation of such monstrosities may be determined at pleasure, by placing the eggs in certain conditions unfavourable to development. In this case the blastodermic ridge forms on its surface two tubercles instead of one,

* Edinburgh Monthly Journ. Med. Science (1844), IV., pp. 479, 568, 639. See also Vrolik's article on Teratology. in Cyc. Anat. and Phys.

† Vrolik, Op. Cit.

and from each of these an embryonic fillet is produced, the farther development of which gives rise to double embryos of various kinds.*

It will be observed that the explanation here given of dublication involves a principle like that called *chorisis* in plants, which is employed, with more or less plausibility in different instances, to account for increase in the number of floral organs. We have seen reason to reject its application in several instances where it has been alleged by eminent botanists; but we have never gone so far as to deny that there may be instances in which it supplies the best explanation of remarkable phenomena, and the probability would be increased by a good analogy with what occurs in the animal kingdom.

What follows occurring in connection with the notice of detached sexual structures may suggest a new idea to some, and the appended note details a curious fact only lately established:—

In fact, the whole question of detachment hinges on the proportionate development of the *somatic* life, *i.e.*, the life of the body as one whole, and the more or less independent life of its several organs, or what we may term the *topical* or regional life. In the higher animals the special actions of the several organs are as completely subordinated to that of the body as a whole, as are the powers of local corporations to the central government in any well-ordered state, yet there still remains sufficient evidence of the real existence of a *distinct* topical life. The hairs and teeth of animals generally, and the antlers of the deer, have already been cited as furnishing illustrations of it. The first set of teeth, for instance, are formed each in its own capsule by a process of local growth, quite independent of that of the neighbouring tissues, nay, in so far opposed to it, that at a certain stage of development the integuments of the gum are partially disintegrated to allow of their eruption. A tooth, thus generated by independent growth, some time after attaining maturity, undergoes a process of decay, ending in its ultimate removal, when a new tooth of the second dentition takes its place by a similar process of local growth. In its turn this tooth also is shed, and though in most species it has no successor, yet in a few there is a constant succession during the whole lifetime of the animal; and this is the general rule in the case of the hair.† Hence in such local formations as teeth, hair, &c., we have, in the way they are marked off from the neighbouring parts, and in this succession of growth, maturation, and decay—repeated again and again, and epitomizing, as it were, the life of the animal on which they grow—evidence of a vitality, quite as defined perhaps in itself as that presented by the free zooids of the lower species, though their functional dependence on the common circulation, and the mechanical bond of a common integument, prevent their exhibiting the more obvious phenomena of a separate life. But as we descend in the scale of

* Annals of Nat. History, 2nd Ser., XVI., 49.

† Paget's Lectures on Surgical Pathology. Kirkes' Handbook of Physiology, Ch. X.

organization we come to spe s, where, from the absence of centralizing influences, the several organs—which are possessed of a vitality, less energetic perhaps, but more enduring than in the higher—become emancipated, as it were, from the control of the general system, and appear as zooids, that is, in the guise of independent beings, rather than as integral parts of the same animal—suggesting a comparison to a loose confederation of Indian tribes, or to the feudal system of the middle ages, rather than to a well-ordered polity of our own day.

And though the proper organs of reproduction, from their partial independence even in the higher animals, seem, as we might expect, to manifest most clearly this emancipation from the controlling influence of somatic life, yet it is seen very distinctly in others also, as, for instance, in the peculiarly modified tentacle of the *Argonauta*, which, when filled with spermatic fluid, is detached from the body, and finds its way spontaneously to the female for the purpose of impregnation.*

We must now bring this notice of a valuable addition to physiological literature to a conclusion, which we do with an expression of our expectation that it will be appreciated and widely circulated among the curious in biological science. W. H.

A Treatise on some of the Insects injurious to Vegetation. By Thaddeus William Harris, M.D. A new edition, enlarged and improved, with additions from the Author's MSS. and original notes. Illustrated by engravings drawn from Nature, under the supervision of Professor Agassiz. Edited by Charles L. Flint, Secretary of the Massachusetts State Board of Agriculture. Boston: Crosby & Nichols; New York: Oliver S. Felt. 1862.

It would be superfluous to praise a work of such established reputation as the late Dr. Harris's report, written for the State of Massachusetts, on Insects injurious to Vegetation; but as it has been for some time out of print, and has been inquired for in vain by many, it may not be useless to inform our readers that it now appears in an improved edition, with every advantage that the best paper and printing, and an admirably executed series of illustrative

* The worm-like appearance led at first to its being described as a parasite of this orga under the term of *Hectocotylus*; and even after its sexual relations were determined by Kölliker, it was still considered as an integral, though rudimentary animal, and in this point of view was employed by Darwin (in the first volume of his monograph of the Cirrhipedes) in illustration of the nature and relations of the minute parasitic males occurring in certain genera of that group. The discovery of its true nature as a mere tentacle of a Cuttlefish is due to Verany and H. Müller.

wood cuts and coloured plates can bestow. No one need desire a more pleasing book for his library than Dr. Harris's work in its present form ; and all who are interested in horticulture and rural affairs, as well as in Entomology, will find it eminently useful. We recommend it most cordially. W. H.

SCIENTIFIC AND LITERARY NOTES.

ZOOLOGY.

THE SNOWY OWL.

The local papers contain several notices, two of which we subjoin, of the occurrence, in great numbers of *Nyctea nivea* (*Strix nyctea*, Linn.), the Snowy Owl, on the shores of Lake Ontario. Amongst others, the well-known taxidermist, Mr. Passmore, speaks of having from 30 to 40 specimens in his possession, shot in the neighbourhood of Toronto during the past three weeks. We hear, through private sources, of an equal abundance of this fine bird about Hamilton. At this season, when they migrate from the north, specimens may generally be procured; but the extraordinary numbers this year excite great attention, and arouse our curiosity respecting the cause. Is it to be sought in circumstances in the northern regions having favoured the bringing-up of a much larger number than usual, in greater severity of cold driving them more rapidly and in a more crowded manner on their southern wanderings, or in a peculiar abundance of suitable food around our lake, bringing together in this quarter all the emigrants from a wide-spread region?

We are informed that they appeared in similar numbers in 1837; and Mr. Passmore gives 1833, 1839, and 1853 as abundant years. Mr. Passmore speaks of the male as almost invariably white; the female larger, and beautifully mottled with black. The greater size of the female is observable in many birds, and is very characteristic of *Raptores*. The young male is marked like the female, and continues to be so for some time, gradually losing the spots, until at a good age he reaches a snowy whiteness. Hence as comparatively few escape the various dangers to which they are exposed, very white specimens are always much valued by collectors. It is interesting to observe the progress made from year to year in assuming the white livery; but a majority of the males obtained have the spots almost as conspicuous as the females. W. H.

To the Editor of the Leader.

Sir,—In your paper of the 12th inst., I noticed an account of the capture, by a Mr. Harvey, of a large owl, which, by the description given, appears to have been the snowy owl (*Strix nyctea.*) According to Wilson, these birds have their home among the barren rocks of Greenland, and are only driven to our more temperate region by the severity of winter. In their migratory course, they seem to keep by the line of the great lakes, attracted, doubtless, by the quantities of dead fish and waterfowl which at this season of the year are strewn along the shore. In this vicinity a few are generally seen every season; but never, in the recollection of the oldest inhabitant, have they appeared in such numbers as during the present month.

On the 12th inst., the writer, in company with a friend who is making a collection of Canadian birds, visited Burlington Beach, in the hope of obtaining a specimen of the Snowy Owl; and getting there shortly before sunrise, were surprised to find these noble birds quite numerous, and flitting about like ghosts in the grey light of the morning They were rather difficult of approach, usually alighting on a post or dead limb of a tree, from which they kept a vigilant watch for intruders; but by ten o'clock, seven specimens were obtained, all in fine plumage. The female exceeds the male in size, and has the dusky spots larger and more numerous. I am, &c.,

Hamilton, November 17th, 1862. STRIX.

To the Editor of the Leader.

SIR,—In your paper of the 13th inst., you refer to the fact of a large owl having been shot by a Mr. Harvey, and state that it is the only bird of the kind ever seen by him in its wild state. This would lead one to imagine that this variety—the Snowy Owl (*Strix nyctea*)—was rare. This is not the case. I have now in my possession between forty and fifty specimens, which have been shot in this neighbourhood during the past two or three weeks, some of these measuring five feet four inches from wing to wing.

The male of this species is almost invariably white. The female is larger, and is beautifully mottled with black. During the past two years they have been rarely shot in this vicinity, but they were in great plenty in 1833, 1839, and in 1853. Yours, &c.,

Toronto, November 17th, 1862. S. PASSMORE.

POISONOUS PARTRIDGES.

In the 'Times' of Wednesday, September 10th, is a letter from Mr. F. Taylor, of Romsey, giving an account of some cases of poisoning by the flesh of Canadian partridges. It appears that in Canada, when the snow is on the ground, the birds are forced by hunger to feed on certain berries which render them unsafe for human food. What these berries are does not appear. Mr. Taylor's account of the poisonous effects produced is as follows:—

"On the 8th of last March I was sent for hurriedly to a lady who wrs described as dying. I found her cold, insensible, and pulseless. She had been sick while lying upon her back. I forced her to swallow a wineglassful of brandy, and took other measures for some hours to stimulate and recover the warmth and circulation, and partially succeeded. She remained, however, insensible, and almost in a hopeless state for many hours, at last gradually recovering, but for several weeks suffered from ill health in many ways. On regaining her consciousness, and during the whole of the following day, she experienced a most uncomfortable sensation of 'acute thrilling,' especially on the slightest movement of the muscles of the face. I suspected poison in this case, but I could not recognise the symptoms of any one poison in particular. I found that the lady had dined about two hours and a half previously to the attack, and that she had eaten part of one of these Canadian partridges. The birds were perfectly fresh, having been packed in ice. Five days after this occurrence I was sent for hurriedly to see a younger lady, the wife of a gentleman who had had a case of partridges sent him from Canada, and who had presented a brace ol them to my first patient. I found this lady cold and pulseless, and feeling paralyzed, with 'a peculiarly horrid thrilling sensation all over her,' and a very painful sense of constriction in her throat. She had eaten for supper heartily o one of these Canadian partridges, and within a few minutes felt ill as I have described. I gave her mustard emetics, and afterwards brandy in large quanti ties; and gradually, after many hours of intense suffering, the lady recovered and in a few days regained her usual good health. On the night of her extrem illness, while sitting in the bedroom, I noticed a young cat there, which, i attempting to move, fell over on its side, and upon lifting it up I found th hinder legs paralysed, so as to be quite useless; and upon the poor thing attempt ing to walk or leap, it fell helplessly on its side again. The lady told me tha during supper she had thrown to this cat some bits of the patridge. It wa found that the poor thing had been thoroughly sick. The cat continued to b paralysed, but gradually recovered in a few days, no doubt saved by the natur act of vomiting. My impression is, that the younger lady might have recovere without help; but she was, I am certain, very materially benefitted by induce sickness and by large doses of brandy. The elder lady, I feel sure, would ha died unless prompt and continued strong measures had been taken to keep th flickering and almost exhausted flame of life burning."

It has long been known that the poisonous principles of certain plants reta n their properties after having passed through the digestive laboratory and becor e incorporated in the tissues or secretions. Modern chemistry, by showing th t the vegetable alkaloids pass through the animal body undecomposed, and m y be detected under favourable circumstances, has only confirmed a very comm n observation. The flesh of hares which have browsed on the *Rhododendr n chrysanthemum*, and that of young pheasants after feeding on the buds a d shoots of the *Kalmia latifolia*, acquire deleterious properties. So also the m lk and flesh of cattle grazing on some of the mountain herbage of South Amer ca have been found poisonous. Some time ago several persons near Toulouse w re poisoned by a dish of snails, which had been fattened on the leaves and sho ts of *Coriaria myrtifolia*. In all these instances the vegetable principles seem to be incapable of affecting the animals themselves. The poisonous effects of ho ey obtained by bees from certain species of Kalmia, Azalea, and Rhododendron, are also well known. It is said that the plague mentioned by Xenophon, from wh ch the 10,000 Greeks suffered in their retreat, was produced by eating honey col- lected from the *Azalea Pontica*—the "Œgolethron" of the ancients. The eff cts produced by such honey are of a narcotico-irritant character, and in some instances have been of long duration. Even the mead made from it is hig ly poisonous.—*Med. Times and Gazette.*

MISCELLANEOUS.

MEETING OF ENTOMOLOGISTS.

A highly interesting meeting of Entomologists was held on Friday evening, September 26th, at the residence of Professor Croft, Yorkville, for the purpose of taking into consideration the advisability of forming a club or society of those engaged in the study of Insects.

The following gentlemen were present:—The Rev. Prof. Hincks and Prof. Wilson, of University College, Toronto; Dr. Cowdry, York Mills; Dr. B. R. Morris, Toronto; Thos. J. Cottle, Esq., Woodstock; W. L. Lawrason, Esq., E. Baynes Reed, Esq., and Wm. Saunders, Esq., of London, C. W.; and the Rev. C. J. S. Bethune, Cobourg.

A large number of specimens were exhibited by many of those present, among which may be especially mentioned the varied and extensive collection of Prof. Croft. After these had been duly inspected, the attention of the meeting was directed to the object for which it had been more particularly assembled, viz., the formation of an Entomological Club. A discussion therefore arose, in the course of which, while all concurred in the opinion that such a club would be very beneficial in many respects, it was agreed upon that, for the present, no organization should be attempted, inasmuch as so few Entomologists were present; but that efforts should be made to hold another meeting next spring, about the time of the Annual Conversazione of the Canadian Institute.

The advantages to be derived from such a club as that contemplated, are undoubtedly manifold and great. In the first place, the results of the investigations of Entomologists in various parts of the country would be made available for mental information and assistance, and not confined, as hitherto, to a single individual and his particular correspondents. In the next place, a complete list of the various genera and species of Insects known to inhabit the country, could in a short time be formed from the collected materials of isolated students, and by this means reliable data be afforded on which to base further operations. Again, encouragement would be given to those now almost disheartened by the difficulties of the pursuit. New votaries would soon be attracted; and, in short, Entomology would receive such an impetus as would raise it to the level of other more favoured branches of science.

That such beneficial results may be obtained, however, it is necessary that there should be perfect unanimity with regard to the manner in which the machinery is to be set in motion, and that all should co-operate willingly and heartily in the undertaking. Looking at the smallness of the number of those at present engaged in the study of Insects in this country, such results may appear to many as but the fond aspirations of an enthusiast; but when we contemplate what has been done elsewhere, and consider from what feeble beginnings some of the mighty societies in the Mother Country and abroad, derived their origin, such anticipations are surely by no means visionary or absurd. Let Entomologists only endeavour,—each one in his own locality,—to do all that lies in his power for the furtherance of these designs, and they may feel assured that success, beyond perhaps what they now imagine, will undoubtedly crown their efforts. B.

SCIENTIFIC BALLOON ASCENT.

Several balloon ascents have recently been made for scientific purposes by Mr. Glaisher, accompanied by, and under the guidance of, the celebrated aëronaut Mr. Coxwell. The most remarkable and one of the most eventful of these took place on Friday, the 5th of September. The day was capricious, being alternately fine and lowering, until finally, at the time of starting, an afternoon's rain seemed inevitable. The cords were loosed exactly at one o'clock, and the balloon coasted off in a southwesterly direction. The balloon, as on previous occasion, was not quite filled, on account of the expanding effects of the atmosphere at two or three miles' altitude. It contained 60,000 feet of excellent gas, prepared under the able superintendence of Mr. Proud, engineer to the gas-works. Some pigeons were on this occasion allowed to accompany the expedition. In addition to the instruments previously taken, Mr. Glaisher took with him a camera, in order, if possible, to take photographs of the different phases of the clouds. He also took a newly-invented barometer, for the purpose of securing more correct observations of the state of the atmosphere than were previously possible. These observations have formally been taken by Gay-Lussac's siphon barometer and an aneroid; but as the correctness of the readings of the siphon barometer mainly depend upon having a perfectly calibred tube, and as the large size of the general barometer tube renders perfect calibration impossible, or at least very difficult, Messrs. Negretti and Zambra have constructed a barometer expressly for the purpose of checking the observations which have been made in order to test their correctness. With this view a good tube was selected, six feet in length, and the mercury boiled through the whole of that length. A cistern was then blown on its lower extremity, and a stopcock added, by which means the mercury was allowed to decrease inch by inch from the tube into the cistern, and the rise which took place in the cistern was subsequently accounted for in dividing the scale; the upper part of the tube was used to construct the barometer; and by this instrument a direct reading is obtained without any corrections being necessary for the displacement of the mercury in the cistern down to eight inches. The difference, if any be found, between this barometer and the Gay-Lussac siphon used in former ascents will be due to the inequalities in the tube of the latter. Among others, Lord Wrottesley was present when the ascent took place. The following interesting account of this ascent was furnished by Mr. Glaisher to the 'Times':—

To the Editor of the 'Times.'

Sir,—On the earth at 1h. 3m. the temperature of the air was 59°; at 1h. 13m., at the height of a mile, it was 39°; and shortly afterwards we entered a cloud, which was about 1100 feet in thickness, in which the temperature of the air fell to 36½°, and the wet-bulb thermometer read the same, showing the air here was saturated with moisture. On emerging from the cloud at 1h. 17m. we came into a flood of light, with a beautiful blue sky without a cloud above us, and a magificent sea of cloud below; its surface being varied with endless hills, hillocks mountain chains, and many snow-white masses rising from it. I here tried to take a view with the camera, but we were rising too rapidly and revolving too rapidly for me to do so; the flood of light, however, was so great that all I should have needed would have been a momentary exposnre, as Dr. Hill Norris had kindly furnished me with extremely sensitive dry plates for the purpose.

When we attained the height of two miles, at 1h. 21m., the temperature had fallen to the freezing-point; we were three miles high at 1h. 28m., with a temperature of 18°; at 39m. we had reached four miles, and the temperature was 8°; in 10 minutes more we had reached the fifth mile, and the temperature of the air had passed below zero, and there read minus 2°; and at this point no dew was observed on Regnault's hygrometer when cooled down to minus 30°. Up to this time I had taken the observations with comfort. I had experienced no difficulty in breathing, while Mr. Coxwell, in consequence of the necessary exertion he had to make, had breathed with difficulty for some time. At 1h. 51m. the barometer read 11·05 inches, but which requires a subtractive correction of 0·25 inch, as found by comparison with Lord Wrottesley's standard barometer just before starting, both by his Lordship and myself, which would reduce it to 10·8 inches, or at a height of about 5¼ miles. I read the dry bulb as minus five degrees; in endeavouring to read the wet bulb I could not see the column of mercury. I rubbed my eyes, then took a lens, and also failed. I then tried to read the other instruments, and found I could not do so, nor could I see the hands of the watch. I asked Mr. Coxwell to help me, and he said he must go into the ring, and he would when he came down. I endeavoured to reach some brandy, which was lying on the table at about the distance of a foot from my hand, and found myself unable to do so. My sight became more dim; I looked at the barometer and saw it between 10 and 11 inches, and tried to record it, but I was unable to write. I then saw it at 10 inches, still decreasing fast, and just noted it in my book; its true reading therefore was at this time about 9¾ inches, implying a height of about 5¾ miles, as a change of an inch in the reading of the barometer at this elevation takes place on a change of height of about 2500 feet; I felt I was losing all power, and endeavoured to rouse myself by struggling and shaking. I attempted to speak, and found I had lost the power. I attempted to look at the barometer; my head fell on one side. I struggled and got it right, and it fell on the other, and finally fell backwards. My arm, which had been resting on the table, fell down by my side. I saw Mr. Coxwell dimly in the ring. It became more misty, and finally dark, and I sunk unconsciously as in sleep; this must have been about 1h. 54m.

I then heard Mr. Coxwell say, "What is the temperature? Take an observation; now try." But I could neither see, move, nor speak. I then heard him speak more emphatically, "Take an observation; now do try." I shortly afterwards opened my eyes, saw the instruments and Mr. Coxwell very dimly, and soon saw clearly and said to Mr. Coxwell, "I have been insensible;" and he replied, "You have, and I nearly." I recovered quickly, and Mr. Coxwell said, "I have lost the use of my hands; give me some brandy to bathe them." His hands were nearly black. I saw the temperature was still below zero, and the barometer reading 11 inches, but increasing quickly. I resumed my observations at 2h. 7m., recording the barometer reading 11·53 inches, and the temperature minus 2. I then found that the water in the vessel supplying the wet bulb thermometer, which I had by frequent disturbances kept from freezing, was one solid mass of ice. Mr. Coxwell then told me that while in the ring he felt it piercingly cold, that hoar frost was all round the neck of the balloon, and on attempting to leave the ring he found his hands frozen, and he got down how he could; that he found me motionless, with a quiet and placid expression on the countenance. He spoke to me without eliciting a reply, and found I was insensible. He then said he felt insensibility was coming over himself, that he became anxious to open the valve, that his hands failed him, and that he seized the line between his teeth and pulled the valve open until the balloon took a turn downwards. This act is quite characteristic of Mr. Coxwell. I have never yet seen him without a ready means of meeting every difficulty as it has arisen, with a cool self-posession that has always left my mind perfectly easy and given to me every confidedce in his judgment in the management of so large a balloon.

On asking Mr. Coxwell whether he had noticed the temperature, he said he could not, as the faces of the instruments were all towards me; but that he had noticed that the centre of the aneroid barometer, its blue hand, and a rope attached to the car, were in the same straight line. If so, the reading must have been between 7 and 8 inches. A height of six miles and a half corresponds to 8 inches. A delicate self-registering *minimum* thermometer read minus 12°, but unfortunately I did not read it till I was out of the car, and I cannot say that its index was not disturbed.

On descending, when the temperature rose to 17°, it was remarked as warm, and at 24° it was noted as very warm.

The temperature then gradually increased to 57½° on reaching the earth. It was remarked that the sand was quite warm to the hand, and steam issued from it when it was discharged. Six pigeons were taken up. One was thrown out at the height of three miles; it extended its wings and dropped as a piece of paper. A second, at four miles, flew vigorously round and round, apparently taking a great dip each time. A third was thrown out between four and five miles, and it fell downwards. A fourth was thrown out at four miles when we were descending; it flew in a circle and shortly after alighted on the top of the balloon. The two remaining pigeons were brought down to the ground; one was found to be dead, and the other (a carrier) had attached to its neck a note. It would not however leave, and when jerked off the finger returned to the hand. After a quarter of an hour it began to peck a piece of ribond encircling its neck, and I then jerked it off my finger, and it flew round two or three times with vigour, and finally towards Wolverhampton. Not one, however, had returned there when I left on the afternoon of the 6th.

Too much praise cannot be given to Mr. Proud, the engineer of the gas-works, for the producfion of gas of such a light specific gravity.

It would seem from this ascent that five miles from the earth is very nearly the limit of human existence. It is possible, as the effect of each high ascent upon myself has been different, that on another occasion I might be able to go higher, and it is possible that some persons may be able to exist with less air and bear a greater degree of cold; but still I think that prudence would say to all, whenever the barometer reading falls as low as 11 inches, open the valve at once: the increased information to be obtained is not commensurate with the increased risk.

Sept. 9. JAMES GLAISHER.

MONTHLY METEOROLOGICAL REGISTER, AT THE PROVINCIAL MAGNETICAL OBSERVATORY, TORONTO, CANADA WEST,—AUGUST, 1862.

Latitude—43 deg. 39.4 min. North. Longitude—5 h. 17 m. 33 s. West. Elevation above Lake Ontario, 108 feet.

Day.	Barom. at temp. of 32°.				Temp. of the Air.				Excess of mean above Normal.	Tens. of Vapour.				Humidity of Air.				Direction of Wind.			Resul't. Direction.	Velocity of Wind.					Rain in inches.	Snow in inches.
	6 A.M.	2 P.M.	10 P.M.	Mean.	6 A.M.	2 P.M.	10 P.M.	ME'N		6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.	M'N	6 A.M.	2 P.M.	10 P.M.		6 A.M.	2 P.M.	10 P.M.	Re-sul't.	ME'N		
1	29.690	29.644	29.624	29.6513	63.4°	80.0°	71.3°	72.72°	+ 5.75°	.494	.629	.509	.567	.85	.61	.66	.71	N W b W	S b W	N b W	S 63° W	3.5	9.0	5.0	3.11	6.14	...	...
2	.668	.641	.623	.6415	68.1	76.0	71.3	71.82	+ 4.97	.524	.573	.570	.565	.77	.64	.76	.73	N b E	S b E	E S E	N 69 E	6.5	6.0	11.0	2.69	3.71	0.006	...
3	.623	.565	—	—	66.6	76.7	—	—	—	.572	.551	—	—	.87	.59	—	—	N E	E	E	S 73 E	3.4	7.8	3.5	4.30	5.33	...	...
4	.544	.540	.552	.5338	73.8	82.9	73.5	77.22	+10.42	.663	.822	.716	.737	.80	.73	.87	.79	S S E	S b W	S b E	S 24 W	5.4	10.2	3.8	8.60	8.93	...	...
5	.524	.569	.649	.5880	71.0	76.7	62.3	70.17	+ 3.37	.671	.628	.471	.583	.89	.68	.84	.79	W S W	W b N	W N W	N 64 W	5.5	9.0	5.0	6.57	7.60	Inp.	...
6	.748	.775	.802	.7722	59.8	74.2	63.7	66.80	+ 0.03	.405	.511	.452	.460	.78	.60	.76	.70	N W	S b W	W b N	S 70 W	6.0	9.3	1.8	1.27	5.03	0.045	...
7	.803	.694	.656	.6733	65.9	71.7	71.7	69.65	+ 2.97	.595	.560	.603	.588	.93	.72	.78	.81	E b N	E b S	S W	S 39 E	2.8	8.4	3.0	2.15	4.64	0.312	...
8	.506	.454	.382	.4407	73.5	87.6	75.6	79.08	+12 42	.748	.812	.721	.772	.91	.62	.81	.79	S W	W S W	S W b S	S 54 W	5.0	7.8	4.6	6.55	7.20	Inp.	...
9	.326	.332	.456	.3777	74.2	83.6	64.5	73.73	+ 7.18	.704	.726	.494	.639	.83	.63	.81	.76	W S W	W	N W b W	N 70 W	2.5	18.5	3.0	9.28	10.05	0.038	...
10	.567	.613	—	—	61.6	74.6	—	—	—	.493	.521	—	—	.90	.60	—	—	N W	S b E	N N W	N 75 E	2.8	4.5	3.0	3.60	4.46	...	...
11	.575	.484	.427	.4862	62.7	69.9	74.2	71.33	+ 4.90	.404	.670	.677	.610	.71	.92	.80	.79	N b E	S S W	W S W	S 89 W	5.0	7.6	4.6	2.46	6.00	0.051	...
12	.621	.658	.737	.6772	63.0	77.8	61.6	67.88	+ 1.55	.450	.422	.334	.393	.78	.45	.61	.59	W	W N W	N N W	N 49 W	6.5	14.4	9.0	9.44	10.00	...	...
13	.831	.775	.705	.7712	56.9	71.3	59.0	63.15	— 3.08	.351	.377	.403	.383	.76	.49	.81	.68	N N W	S b E	S	S 5 E	6.2	6.8	1.5	1.57	3.99	...	...
14	.595	.503	.461	.5163	59.4	62.7	61.9	62.17	— 4 07	.446	.530	.528	.492	.88	.93	.95	.88	N E	S W b S	W N W	S 77 W	1.5	7.0	4.5	4.05	5.19	0.618	...
15	.551	.634	.743	.6573	58.7	66.6	55.4	61.10	— 5.05	.407	.286	.295	.323	.82	.43	.67	.61	N N W	N W	N W	N 40 W	7.5	13.0	1.8	8.51	8.92	...	...
16	.858	.898	.921	.8962	55.1	65.5	51.1	58.80	— 7.23	.320	.454	.299	.368	.73	.72	.80	.73	N b W	S W b S	N W b N	N 65 W	4.5	8.2	3.0	2.15	4.52	...	...
17	.947	.864	—	—	49.0	70.2	—	—	—	.297	.430	—	—	.83	.58	—	—	N N E	S	S S W	S	1.8	10 6	3.0	3.42	3.92	...	...
18	.739	.662	.683	.6880	57.2	72.8	63 0	64.42	— 1.42	.381	.503	.462	.459	.81	.62	.80	.76	Calm.	S E b S	N	N 8 E	0.0	6.0	9.0	2.27	4 76	0.420	...
19	.667	.640	.641	.6500	59.8	71.7	60.5	64.97	— 0.80	.428	.518	.360	.445	.83	.66	.69	.72	N	S b E	Calm.	S 43 E	4.2	4.5	0.0	1.79	3.28	...	...
20	.693	.666	.687	.6818	57.6	78.9	66.3	68.57	+ 3.02	.376	.646	.508	.517	.79	.65	.78	.73	Calm.	S b E	N b W	N 59 W	0.0	6.5	5.5	0.70	4.64	...	...
21	.731	.665	.559	.6222	62.3	72.4	68.4	68.85	+ 3.42	.484	.550	.632	.552	.86	.69	.92	.78	N b E	E b S	E	S 81 E	4.4	9.5	3.0	5.11	5.60	0.331	...
22	.425	.353	.450	.4085	68.1	75.3	65.9	68.80	+ 3.45	.637	.694	.399	.580	.93	.79	.62	.81	S b W	W S W	W b N	S 79 W	1.8	10.0	10.8	5.68	7.55	0.433	...
23	.543	.649	.844	.6870	60.1	70.6	56.5	62.55	— 2.58	.436	.362	.281	.357	.84	.48	.61	.64	W S W	N N W	N N W	N 25 W	0.5	21 5	5.4	7.38	9.49	...	...
24	.977	.971	—	—	50.0	60.5	—	—	—	.238	.349	—	—	.78	.66	—	—	N E b N	E N E	N N E	N 65 E	6.5	7.5	4.0	4.97	5.79	...	...
25	.775	.662	.609	:6782	51.5	73.8	68.4	66.07	+ 1.33	.274	.475	.590	.463	.71	.57	.85	.70	N b E	S	W N W	S 42 W	3.0	5.8	4.8	2.93	3.62	0.038	...
26	.565	.487	.493	.5042	64.1	83.2	69.2	72.68	+ 8.15	.552	.588	.565	.582	.92	.51	.79	.74	Calm.	S W	W S W	S 79 W	0.0	9.5	0.5	2.58	5.28	0.242	...
27	.479	.493	.463	.4817	65.2	70.6	66.6	67.28	+ 2.97	.577	.603	.586	.696	.92	.80	.90	.88	E b S	S E b E	S E b E	S 67 E	2.5	5.2	5.5	1.51	4.05	0.293	...
28	.409	.390	.404	.4005	64.8	75.3	66.6	69.45	+ 5.32	.582	.647	.519	.571	.95	.74	.79	.80	N W b W	S W b S	W b S	N 60 W	2.8	8.0	8.5	8.33	9.57	...	...
29	.578	.628	.794	.6810	56.9	69.9	55.8	61.00	— 2.82	.351	.447	.218	.355	.76	.61	.48	.64	N W	N W b W	N b W	N 27 W	6.2	7.5	6.5	7.29	7.44	...	...
30	.913	.861	.775	.8477	48.2	64.5	54.7	57.43	— 6.18	.207	.319	.337	.297	.60	.53	.78	.63	N	S	S b W	S 13 W	5.5	4.2	3.0	1.49	2.65	...	...
31	.725	.560	—	—	47.7	68.4	—	—	—	.304	.468	—	—	.91	.67	—	—	N W b N	E	E b N	S 36 E	2.0	7.0	3.5	2.58	5.46	0.656	...
M	29.6290	29.6060	29.6109	29.6161	62.36	74.06	64.58	67.60	+ 1.84	.479	.552	.482	.510	.82	.65	.77	.74	......	......	......	......	3.74	8.74	4.55	......	5.96	3.483	......

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR AUGUST, 1862.

Highest Barometer . . . . 29.977 at 6 a. m. on 24th. } Monthly range=
Lowest Barometer . . . . 29.326 at 6 a. m. on 9th. } 0.651 inches.

Self-registering Ther.:
Maximum temperature . . . . 89°5 on p.m. of 6th } Monthly range=
Minimum temperature . . . . 42°8 on a.m. of 30th } 46°7
Mean maximum temperature . . 76°11 } Mean daily range=17°89
Mean minimum temperature . . 58°22 }
Greatest daily range . . . . 26°8 from a. m. to p. m. of 25th.
Least daily range . . . . 7.3 from a. m. to p. m. of 27th.

Warmest day . . . 8th ...Mean Temperature . . .=79°08 } Difference=21°65.
Coldest day . . . . 30th ...Mean Temperature . . .=57°43 }
Maximum Radiation { Solar . . . . 104°5 on p.m of 8th } Monthly range=
{ Terrestrial . . . . 33°0 on a. m. of 30th } 71°.5

Aurora observed on 9 nights, viz.: 9th, 13th, 18th, 19th, 23d, 24th, 28th, 29th and 30th. Possible to see Aurora on 23 nights; Impossible on 8 nights.

Raining on 15 days; depth, 3·483 inches; duration of fall, 37.1 hours.

Mean of cloudiness=0.45; above the average, 0.00. Most cloudy hour observed, 2 p.m.; mean=0.57; least cloudy hour observed, 10 p.m.; mean=0.29.

Sums of the components of the Atmospheric Current, expressed in Miles.

North.	South.	East.	West.
1584.37	1334.41	755.46	1969.46

Resultant direction, N. 78° W.; Resultant Velocity, 1.67 miles per hour.
Mean velocity 5.96 miles per hour.
Maximum velocity 23.4 miles, from 3 to 4 p.m. on the 9th.
Most windy day 9th—Mean velocity 10.05 miles per hour.
Least windy day 30th—Mean velocity 2.65 miles per hour.
Most windy hour, 3 to 4 p.m.—Mean velocity, 9.51 miles per hour. } Difference
Least windy hour, 6 to 7 a.m.—Mean velocity, 3.45 miles per hour. } 6.06 miles.

2nd. Thunderstorm 10 to 11 a.m., and sheet lightning at night.—4th. Sheet lightning during the evening.—7th. Sheet lightning in N.W. at midnight.—8th. Very sultry day; sheet lightning in N.E. at 8 p.m.—11th. Slight thunderstorm 0.30 to 1.30 p.m., and again from 7 to 10 p.m.—14th. Ground fog 9 to 10 p.m.—18th. Thunderstorm 1.40 to 3 p.m.—21st. Sheet lightning and distant thunder in W. at 11 p.m. and midnight.—22nd. Thunderstorm 3 to 10.30 a.m.; perfect rainbow at 6.30 p.m.—27th. Thunderstorm 2 to 5 a.m.; sheet lightning 8 p.m. to midnight.—28th. Dense wetting fog till 7 a.m.—30th. Hoar frost on footpaths at 6 a.m. (first of the season).—31st. Thunderstorm from 8 to 11 p.m.

Heavy dew recorded on 16 mornings during this month.

30th. 9 p.m., Beautiful band of light ascending from West to within 10° of Zenith; its breadth was about 3°; it remained stationary upwards of fifteen minutes.

August, 1862, was comparatively mild, wet, and windy, and had exactly the mean amount of cloudiness.

COMPARATIVE TABLE FOR AUGUST.

YEAR.	TEMPERATURE.					RAIN.		SNOW.		WIND.		
	Mean.	Excess above Average, (66°0).	Maximum observed.	Minimum observed.	Range.	No. of days.	Inches.	No. of days.	Inches.	Resultant. Direction.	Resultant. Velocity.	Mean Velocity
1840	° 64.7	— 1.3	° 80.1	° 47.4	° 32.7	12	2.905	...	...	...	...	...
1841	64.4	— 1.6	83.5	46.7	36.8	9	6.170	...	...	...	...	0.19lbs
1842	65.7	— 0.3	80.7	45.3	35.4	6	2.500	...	...	...	...	0.30 "
1843	66.4	+ 0.4	85.5	44.4	41.1	4	4.850	...	...	...	...	0.12 "
1844	64.3	— 1.7	82.5	44.3	38.2	17	Imp.	...	...	...	...	0.16 "
1845	67.9	+ 1.9	82.5	44.4	38.1	9	1.725	...	...	...	...	0.19 "
1846	68.4	+ 2.4	86.3	50.4	35.9	9	1.770	...	...	...	...	0.17 "
1847	65.1	— 0.9	83.1	44.9	38.2	10	2.140	...	...	...	...	0.19 "
1848	69.2	+ 3.2	87.5	49.3	38.2	8	0.855	...	...	S 21 E	0.98	4.55ms.
1849	66.3	+ 0.3	79.5	51.4	28.1	10	4.970	...	...	N 71 W	0.60	3.76 "
1850	66.8	+ 0.8	84.2	43.0	41.2	13	4.355	...	...	N 15 E	0.35	4.46 "
1851	63.6	— 2.4	79.8	43.6	36.2	10	1.360	...	...	N 63 W	0.40	4.63 "
1852	65.9	— 0.1	81.2	46.7	34.5	9	2.695	...	...	N 70 E	0.56	3.30 "
1853	68.6	+ 2.6	91.6	47.6	44.0	11	2.575	...	...	S 36 E	0.30	4.26 "
1854	68.0	+ 2.0	98.1	47.0	51.1	5	0.455	...	...	N 64 W	1.76	4.60 "
1855	64.1	— 1.9	82.1	44.9	37.2	7	1.455	...	...	N 63 W	1.04	6.97 "
1856	63.6	— 2.4	81.3	44.0	37.3	12	1.680	...	...	N 50 W	2.88	7.03 "
1857	65.9	— 0.7	85.3	50.1	35.2	13	5.265	...	...	N 77 W	1.51	6.36 "
1858	67.6	+ 1.6	83.4	45.4	38.0	11	3.890	...	...	N 69 W	1.57	6.50 "
1859	66.6	+ 0.6	81.4	46.2	35.2	11	3.990	...	...	N 36 W	1.62	5.96 "
1860	64.5	— 1.5	81.8	47.1	34.7	14	3.405	...	...	N 70 W	1.83	5.80 "
1861	65.5	— 0.5	82.5	48.2	34.3	15	2.953	...	...	N 8 E	0.46	4.21 "
1862	67.6	+ 1.6	87.6	47.7	39.9	15	3.483	...	...	N 78 W	1.67	5.96 "
Results to 1861.	66.02	...	83.81	46.47	37.35	10.2	2.951	...	...	N 58 W	0.85	5.17
Diff. for 1862.	+1.58	...	+ 3.79	+ 1.23	+ 2.55	+ 4.8	+ 0.532	...	...	...	...	+0.79

Latitude—43 deg. 39.4 min. North. Longitude—5 h. 17 min. 33 sec. West. Elevation above Lake Ontario, 108 feet.

Day.	Barom. at temp. of 32°. 6 A.M.	2 P.M.	10 P.M.	MEAN.	Temp. of the Air. 6 A.M.	2 P.M.	10 P.M.	ME'N	Excess of mean above Normal.	Tens. of Vapour. 6 A.M.	2 P.M.	10 P.M.	M'N	Humidity of Air. 6 A.M.	2 P.M.	10 P.M.	M'N	Direction of Wind. 6 A.M.	2 P.M.	10 P.M.	Resultant Direction.	Velocity of Wind. 6 A.M.	2 P.M.	10 P.M.	Result.	ME'N	Rain in Inches.	Snow in Inches.
1	29.129	29.116	29.316	29.1973	67.0°	69.5°	49.3°	61.38°	− 1.65°	.623	.576	.293	.484	.93	.79	.83	.84	S W b S	N W b W	N W b N	N 54° W	6.0	19.5	16.0	12.26	14.46	...	...
2	.530	.606	.684	.6172	43.9	55.8	42.5	47.45	−15.28	.218	.228	.227	.221	.75	.50	.83	.68	N N W	N W b N	N b W	N 27 W	13.8	13.5	2.0	8.67	8.82	...	...
3	.782	.733	.726	.7417	41.0	61.9	59.1	55.50	− 6.93	.200	.285	.402	.319	.78	.51	.80	.71	N W	S b E	S	S 7 W	4.0	7.9	2.4	2.84	3.19	...	...
4	.691	.675	.687	.6960	59.0	73.8	58.7	64.45	+ 2.32	.428	.574	.457	.483	.86	.69	.93	.80	W S W	S S W	Calm.	S 28 W	2.2	11.5	[illegible]	5.65	5.71	...	...
5	.709	.619	.561	.6237	58.3	78.9	69.5	69.32	+ 7.48	.472	.659	.575	.557	.97	.67	.79	.75	Calm.	S b W	S W	S 27 W	0.0	9.4	2.0	3.47	3.58	0.800	...
6	.584	.547	.543	.5550	66.6	76.0	65.9	69.63	+ 8.20	.628	.731	.609	.664	.96	.81	.95	.94	S S W	S W b S	E b N	S 22 W	6.4	8.8	1.8	1.68	2.41	0.560	...
7	.507	.499	—	—	65.9	74.6	—	—	—	.609	.656	—	—	.95	.77	—	—	S S E	S W b S	S W	S 37 W	2.0	15.5	6.0	7.52	7.67	0.040	...
8	.472	.499	.713	.5678	65.9	74.6	61.2	67.27	+ 6.53	.595	.373	.374	.450	.93	.43	.69	.68	S W	W b N	N W	N 79 W	5.0	18.0	12.0	8.76	9.87	...	...
9	.860	.898	.865	.8790	50.8	64.8	54.4	57.97	− 2.38	.324	.463	.373	.398	.87	.75	.88	.82	Calm.	S	Calm.	N 64 E	0.0	1.5	0.0	1.14	2.09	...	...
10	.891	.848	.791	.8368	52.6	67.0	60.1	61.03	+ 0.98	.310	.486	.413	.403	.78	.73	.79	.74	N E b N	E b S	N N E	N 77 E	3.0	6.5	3.0	2.42	2.87	...	...
11	.758	.677	.619	.6690	55.1	73.1	68.8	66.22	+ 6.57	.353	.570	.584	.508	.82	.70	.83	.78	N E b N	E	S E b E	S 69 E	2.0	7.0	0.5	2.12	3.18	0.007	...
12	.519	.669	.859	.6963	66.6	65.5	54.0	61.55	+ 2.32	.614	.352	.367	.430	.93	.56	.88	.77	S W	N W b N	N b W	N 27 W	1.5	18.8	9.6	10.97	11.64	0.005	...
13	30.003	.996	.913	.9805	45.0	53.6	46.4	48.70	−10.15	.258	.287	.269	.280	.86	.69	.85	.81	N E b N	S E	N E	N 68 E	3.6	4.0	3.0	2.67	3.75	...	...
14	29.926	.879	—	—	47.9	60.5	—	—	—	.288	.303	—	—	.86	.57	—	—	N	S b W	E	N 12 E	5.5	5.0	1.2	0.82	2.23	...	...
15	.818	.717	.831	.7863	48.6	61.9	57.6	57.48	− 0.43	.312	.515	.434	.437	.91	.93	.92	.91	N	Calm.	N b E	N 22 E	3.5	0.0	7.8	2.72	4.06	0.037	...
16	.872	.835	.785	.8280	55.1	60.9	54.4	56.97	− 0.55	.343	.366	.385	.366	.78	.68	.91	.79	N E b E	E b S	Calm.	N 83 E	5.5	8.0	0.0	3.59	3.98	...	...
17	.706	.599	.416	.5727	56.5	64.8	65.9	62.82	+ 5.82	.425	.542	.581	.514	.93	.88	.91	.89	N E	E	E b N	N 86 E	2.0	9.4	3.5	5.81	6.34	...	...
18	.328	.456	.510	.4582	67.0	73.5	61.2	66.75	+10.13	.594	.564	.486	.542	.90	.68	.90	.83	S S W	W b S	N W b W	S 80 W	5.0	10.0	4.0	5.72	6.77	0.195	...
19	.692	.759	.804	.7650	56.5	65.4	54.7	58.30	+ 2.18	.413	.442	.315	.381	.90	.71	.73	.77	W N W	S W b S	N b W	N 82 W	4.2	7.8	6.0	2.81	4.86	...	...
20	.783	.714	.774	.7505	51.5	65.5	56.2	58.22	+ 2.62	.325	.422	.417	.396	.85	.67	.93	.82	N	S S W	Calm.	S 32 W	0.5	11.5	0.0	2.69	3.85	...	...
21	.865	.877	—	—	55.8	64.1	—	—	—	.400	.499	—	—	.90	.83	—	—	N	E S E	Calm.	S 83 E	3.0	2.5	0.0	2.80	3.00	...	...
22	.800	.744	.735	.7565	51.5	73.5	58.3	62.07	+ 7.43	.367	.593	.436	.473	.97	.72	.90	.85	Calm.	S b E	Calm.	S 10 W	0.0	7.5	0.0	2.28	2.62	...	...
23	.701	.579	.421	.5567	54.4	73.8	65.5	64.75	+10.53	.396	.533	.506	.488	.93	.63	.80	.80	N b E	S b W	S W	S 80 W	2.0	11.0	4.0	2.63	7.29	0.385	...
24	.575	.695	.737	.6815	54.4	59.4	47.5	53.40	− 0.35	.396	.200	.255	.270	.93	.39	.77	.68	N b W	N N W	N N W	N 17 W	12.0	12.0	2.0	6.73	6.82	...	...
25	.760	.722	.707	.7302	45.0	63.0	53.6	54.58	+ 1.35	.230	.424	.340	.333	.77	.73	.82	.77	N W b N	S	W N W	S 26 W	2.2	8.5	2.0	3.55	4.38	...	...
26	.733	.722	.705	.7195	47.1	66.6	58.0	57.48	+ 4.75	.299	.490	.382	.378	.92	.75	.79	.78	W N W	S S W	N W	S 28 W	1.0	8.5	3.0	2.63	2.99	...	...
27	.733	.685	.642	.6823	46.8	64.8	56.5	57.42	+ 5.20	.295	.425	.425	.395	.92	.70	.93	.84	N	E b S	Calm.	N 84 E	1.2	2.0	0.0	0.61	1.04	...	...
28	.602	.531	—	—	52.2	69.5	—	—	—	.358	.507	—	—	.92	.70	—	—	N N E	S S E	Calm.	S 8 E	0.5	2.0	0.0	0.66	1.50	...	...
29	.540	.578	.675	.6115	57.6	65.2	52.6	58.88	+ 7.57	.410	.470	.321	.415	.86	.75	.80	.82	N W b N	N	N b E	N 6 E	2.5	14.5	4.0	6.19	6.71	...	...
30	.740	.820	.835	.7093	49.0	59.0	50.4	49.63	− 1.18	.317	.294	.278	.293	.91	.81	.76	.82	N E	E N E	E	N 64 E	4.0	1.5	9.5	5.08	5.52	0.315	...
...	......	......	......	......	......	......	......	......	......	...	...	...	...	...	...	...	...	......	......	......	......	......	......	......	......	......	......	...
M	29.6811	29.6734	29.6902	29.6830	54.34	66.26	57.01	59.59	+ 2.10	.390	.456	.404	.418	.88	.69	.84	.80	......	......	......	......	3.47	8.76	3.51	......	5.11	2.344	......

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR SEPTEMBER, 1862.

Highest Barometer........................ 30.031 at 8 a. m. on 13th } Monthly range =
Lowest Barometer .... 29.107 at 8 a. m. on 1st } 0.924 inches.

Self-registering Thermom.
- Maximum Temperature .... 79°4 on p.m. of 5th } Monthly range=
- Minimum Temperature .... 39°0 on a.m. of 3rd } 40°4
- Mean maximum Temperature .... 68°43 } Mean daily range=
- Mean minimum Temperature .... 52°77 } 15°66
- Greatest daily range .... 25°8 from a. m. to p.m. of 3rd.
- Least daily range.................. 5°6 from a. m. to p. m. of 12th.

Warmest day......... 6th... Mean temperature......... 69°63 } Difference = 22°18.
Coldest day .... 2nd... Mean temperature......... 47°45 }

Maximum Radiation. { Solar.......................................93°0 on p.m. of 5th } Monthly range = 60°8
{ Terrestrial ....32°2 on a.m. of 3rd }

Aurora observed on 8 nights, *viz.*,—1st. 2nd, 9th, 19th, 24th, 25th, 26th, and 27th.
Possible to see Aurora on 19 nights; impossible on 11 nights.
Snowing on 0 days, depth ... inches; duration of fall, ... hours.
Raining on 9 days,—depth 2.344 inches; duration of fall 29.7 hours.
Mean of cloudiness = 0.47. Below average 0.03.
Most cloudy hour observed, 6 a. m., mean = 0.56; least cloudy. hour observed, 4 p. m.; mean, = 0.38.

Sums of the components of the Atmospheric Current, expressed in mi. ..

North.	South.	East.	West.
1494.21	1103.41	710.48	1373.19

Resultant direction N. 59° W.; Resultant velocity 1.07 miles per hour.
Mean velocity ....5.11 miles per hour.
Maximum velocity .... 23.7 miles, from 4 to 5 p. m. on 1st.
Most windy day ......1st ....Mean velocity, 14.46 miles per hour. } Difference=
Least windy day......27th ....Mean velocity, 1.04 ditto. } 13.42 miles.
Most windy hour ...2 p.m. to 3 p.m. ....Mean velocity, 9.40 ditto. } Difference=
Least windy hour...4 a.m. to 5 a.m. ....Mean velocity 2.97 ditto. } 6.43 miles.

3rd. Hoar frost at 6 a.m.—4th. The comet visible to the naked eye, but very indistinct.—6th. Thunderstorm 5 to 6 p.m.; dense fog at night.—11th. Sheet lightning in W and S. W. during the evening.—15th. Heavy dew and light ground fog at 6 a.m.—22nd. Very dense fog till 8 a.m; fog-bow at 7.10 a.m., perfect, but exhibiting no prismatic colours.—23rd. Heavy dew and light ground fog at 6 a m.; sheet lightning 7.30 to 11.30 p.m.—25th. Hoar frost at 6 a.m.—27th. Heavy dew and slight fog at 6 a.m.; solar halo at 3.20 p.m.; fog at 10 p.m.—28th. Sheet lightning 7 to 9 p.m.

Heavy Dew recorded on 13 mornings during the month.

September, 1862, was comparatively mild, dry, calm, and clear.

COMPARATIVE TABLE FOR SEPTEMBER.

YEAR.	TEMPERATURE.					RAIN.		SNOW.		WIND.		
	Mean.	Excess above aver'ge (57.9)	Max. observed.	Min. observed.	Range.	No. of days.	Inches	No. of days.	Inches	Resultant. Direction.	Resultant. V'y.	Mean Force or Velocity.
1840	54.0	— 3.9	70.2	29.4	40.8	4	1.380	0	...	...	...	....
1841	61.3	+ 3.4	79.9	37.5	42.4	9	3.340	0	...	...	...	0.26 lbs.
1842	55.7	— 2.2	83.5	28.3	55.2	12	6.160	0	...	...	...	0.45
1843	59.1	+ 1.2	87.8	33.1	54.7	10	9.760	0	...	...	...	0.57
1844	58.6	+ 0.7	81.5	29.6	51.9	4	Imp.	0	...	...	...	0.26
1845	56.0	— 1.9	78.8	35.3	43.5	16	6.245	0	...	...	...	0.34
1846	63.6	+ 5.7	84.0	39.0	45.0	11	4.595	0	...	...	...	0.33
1847	55.6	— 2.3	74.8	38.1	36.7	15	6.665	0	...	...	...	0.33
1848	54.2	— 3.7	80.9	29.5	51.4	11	3.115	0	...	N 71° W	2.38	5.81mls.
1849	58.2	+ 0.3	80.6	33.5	47.1	9	1.480	0	...	N 75° W	0.69	4.23
1850	56.5	— 1.4	76.0	31.7	44.3	11	1.735	0	...	S 65° W	1.02	4.78
1851	60.0	+ 2 1	86.3	33.4	52.9	9	2.665	0	...	N 14° E	1.03	5.45
1852	57.5	— 0.4	81.8	36.1	45.7	10	3.630	0	...	N 77° W	0.53	4.60
1853	58.8	+ 0.9	85.4	36.1	49.3	12	5.140	0	...	N	1.06	4.33
1854	61.0	+ 3.1	93.1	36.3	56.8	14	5.375	0	...	N 22° W	1.33	4.04
1855	59.5	+ 1.6	81.7	36.1	45.6	12	5.585	0	...	N 20 E	1.29	7.61
1856	57.1	— 0 8	77.3	37.4	39.9	13	4.105	0	...	S 79° W	1.98	6.53
1857	58.6	+ 0.7	81.4	34.1	47.3	11	2.610	0	...	N 68° W	1.61	5.55
1858	59.1	+ 1.2	80.1	36.8	43.3	8	0.735	0	...	S 74° W	1.53	5.69
1859	55.2	— 2.7	73.8	35.7	38.1	15	3.525	0	...	N 44° W	1.60	6.36
1860	55.3	— 2.6	74.2	28.7	45.5	14	1.959	0	...	N 71° W	2.63	5.79
1861	59.1	+ 1.2	78.2	37.1	41.1	17	3.607	0	...	N 71° W	1.39	4.81
1862	59.6	+ 1.7	78.9	41.0	37.9	9	2.344	0	...	N 59° W	1.07	5.11
Results to 1861.	57.91	...	80.51	34.22	46.30	11.2	3.973	...	...	N 62° W	1.13	5.40
Diff. for 1862.	+ 1.68	...	— 1.61	+ 6.78	— 8.40	— 2.2	— 1.629	...	...	....	......	— 0.29

INDEX.

ERRATA.

Page 448, line 8, *for* Lemaire, *read* Lemoine.
" " " 11, *for* T. W. Cottle, *read* T. J. Cottle.