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ON CHORISIS.

AS AN EXPLANATION OF CERTAIN VEGETABLE STRUCTURES.

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IT has of late years, been the aim of philosophical botanists to establish a few general laws of vegetable structure, capable of explaining all the phenomena which fall under our observation, so as to exhibit a common plan in all the various forms of plants, and show the kind of variations from the general type which occur in each particular instance, or in other words, to trace to the action of intelligible causes the peculiarities observable in each distinct structure, so as to show what is common to many, and how mutual relations are manifested in the midst of apparent diversities. This is, perhaps, to be accounted the highest and most interesting part of the study of nature, and if it must necessarily be preceded by the examination of the details of individual structures, always varied, curious, and attractive, it at least arises out of them as naturally as the philosophy of every science arises out of its facts and observations, combined and meditated upon by the highest intelligences amongst its votaries, aided at times by the happy thoughts of humbler labourers in the same field. I design now

to bring under consideration one of the principles which has been proposed as a general expression of a number of facts in the structure of flowers, or, as a cause which may be assigned in explanation of some remarkable features belonging to particular flowers, explaining at once the relation to the common plan, and the meaning of the apparent discrepancy in the special case.

My subject is what was, I believe, first named by the French botanist Dunal, *chorisis*, a Greek word expressing *division* or *separation* and applied to supposed cases of a single organ in a floral circle being, so to speak, resolved by subdivision into a number of parts. At present, whilst many high authorities admit this principle as affording the true explanation of some remarkable facts in the structure of certain flowers, other authorities of not less general weight entirely reject the principle as unsupported by any sufficient evidence, and not needed to explain the phenomena. In such a case any contribution towards determining the point in dispute may be received with patience and may have some claim to attention. It may be expedient in the first place to consider what are the principles in relation to the structure and variation of flowers which may be regarded as known and established, and to what extent they go in explaining the appearances before us that we may be prepared to judge how far further assistance is required, and, if so, how far the proposed principle supplies what is wanted: nor will this view of what may be said to have been accomplished in an important field of enquiry be in itself destitute of utility since comparatively few years have changed the whole aspect of botanical science, and our greatest practical botanists continue to employ in description, terms founded on erroneous opinions, and suggesting false views where on so many accounts the utmost correctness of language is demanded, besides that the truths to be enumerated, though well established and admitted by those esteemed the best judges, are by no means so generally received and applied as not to require to be explained and enforced.

The 1st principle to be noticed is that every flower originates in an ordinary bud modified in its development, the increase of the axis being checked and the leaves reduced into circles and made to assume the characteristic forms of floral organs, which setting aside intermediate and anomalous ones are 4, described and named as follows: the exterior one, usually retaining most of the leafy character called as a whole the *calyx*, and its separate organs named *sepals*: within it an-

other set of protective or enveloping parts, usually of a more delicate texture, and more likely to be colored, called the *corolla*, and its parts *petals*; then a set of organs so transformed as for the midrid to become a simple support called the *filament*, the lateral expansion to be contracted into cells forming the *anther*, whilst the superficial cells of its infolded surface are specialised into sperm cells called *pollen*. These organs as a whole are called *androecium* and singly *stamens*. In the remaining circle the leaves are made to bear on their margin or at their base *germ* cells called *ovules*, this expanded portion of the leaf or of several such leaves united being the *ovarium*; the apical portion generally drawn out to some length, is the *style*, and the naked glandular tip is the *stigma*. The whole circle of these leaves is the *gynoecium*, individually they are *carpels*. As there are four distinct modifications of leafy organs, forming in typical examples as many circles, there is a manifest convenience in having a name for each circle as a whole and for the parts of each, besides any names required to designate special portions of each organ. I have adopted names from good authority using care in their selection. The chief thing to be observed is the use of the term *gynoecium* for the whole of the inner circle and *carpel* for each separate part. I have judged it necessary to reject entirely the Linnæan term *pistil*, because, the true theory of the structure of the flower not being then understood, he used the term, sometimes for the whole circle of carpels when so united as to seem a single organ; sometimes for each separate style where the ovarian portions of the carpels are united, but their styles distinct, and sometimes for each carpel where they remained entirely separate, the word is useful enough in reference to the Linnæan artificial system, but cannot be employed to express what is now known without being a source of confusion. It is much to be regretted that eminent teachers of the science will persevere in employing it, especially as the evil is greatly aggravated by attempts to give the term a new meaning or to persuade us that Linnæus employed it in accordance with our modern ideas.

2. Having considered what seems well established, respecting the origin of the flower and the nature of its parts, what first claims our notice is the variation in the number of circles.

We have mentioned four differing in kind, but we may have one, two, or three of these absent, and we may have them increased by the occurrence of many circles of one kind of organ. The difference is in the development of the axis of the flower, which varies from a single

circle to an indefinite number, the increase being chiefly in the inner ones. Whenever a flower presents a crowd of similar organs, whether manifestly in successive circles, or by their closeness thrown into a confused mass, the explanation which first occurs to the botanist is multiplication of the circles, whether there may be sometimes reasons for rejecting this and seeking another may be afterwards considered.

3. Our third principle relates to the position of the circles. The most natural and general is with the parts of each (the numbers conforming) alternate with those of the circles without and within it. This evidently depends on the same spiral plan of growth which produces the arrangement of leaves on a stem, the members of the successive circles being indeed produced in the same plane, but when some growth becomes necessary to obtain space for another circle, the advance of the axis being as usual spiral, and to a degree just sufficient to make the parts alternate, but besides that a whole circle may be so nearly suppressed by close pressure, as to be scarcely, if at all, perceptible, which would make those immediately within and without appear opposite, the alternation being maintained by the unnoticed intermediate circle, which is doubtless the true explanation of the stamens opposite to the petals in the Primrose family, it is quite conceivable that in certain cases the spiral course might be either prevented, or carried too far for alternation, the parts thus becoming opposite and abnormal examples occurring in which this is seen to take place, proves that we are justified in assuming it as a sufficient explanation of the rare instances in which adjoining circles with opposite parts occur. Dr Lindley has justly appealed to varieties of *Camellia*, in which the petals are ranged in regular lines, giving the flower a star-like aspect as proof of the possibility of the opposite arrangement taking the place of the alternate, and those who think otherwise are driven to the most extravagant suppositions to evade the force of his argument. But I must afterwards recur to this subject in another connection. At present I wish to show the real nature of the law of alternation, and the possibility of deviation from it in exceptional cases, without disturbing our idea of the plan of structure or driving us to imagine other causes in operation.

4. The degree and mode of development of the separate leafy organs which form each circle may vary from the smallest to the fullest extent, and through several remarkable differences of form. All the parts of the flower consist of leaves modified in their development, and

each is capable of assuming any of the functions, for we have monstrous examples (and I quote none but what I have seen) of carpels occurring among the exterior parts of a half-transformed bud, petals and imperfectly-formed stamens being found within; of stamens with anthers present having stigmas at their tips and imperfect ovaries at their lower portion; of petals and stamens passing by all degrees into each other and of all the circles returning to leaves. Besides these there are well-known intermediate conditions such as used to be called nectaries, and besides the expanded or unfolded condition of an organ, tubular, hooded, and spur or horn-like enlargements are not unfrequently met with. The leading effects of varying development may, in addition to what has been already pointed out, be conveniently noticed under the following heads, connection or separation of parts; equality or inequality of the parts of a circle, and influences on the number of parts. As to the first of these, it is a law of vegetable structure, that portions of growing plants, whether of the same, or of closely allied kinds, being in contact and continuing so, for a time without agitation, will form tissue so as to unite and become as one. This law prevails in the parts of flowers as elsewhere. The result is coherence when organs of the same circle unite by their edges, adherence when organs of adjoining circles unite by their surfaces. Increased development of the parts promotes coherence; closeness of the circles promotes adherence, and differences in these particulars have much to do with the variations of the common plan of flowers.

We need not, however, be in any doubt as to the true explanation of what occurs, as we are familiar with cases of degrees of coherence from the slight attachment of the petals of a Flax or Woodsorrel to the complete union of these parts in a *Convolvulus* or an *Erica*, from the connection of the petals at the base only in some cases, to its reaching the very tip in others, and we may have seen a little starvation restore a *Bellflower* or *Convolvulus* to five separate petals.

It is necessary, to be able to express what happens in precise and accurate language, and as the terms *monosepalous*, *monopetalous*, affirm what is well known not to be true, and are fitted to obscure the ideas of students, whilst DeCandolle's terms, *gamosepalous*, *gamopetalous*, are figurative and too long, and have met with little acceptance, I take this opportunity of proposing terms long used by me, as a teacher, which seem fully to supply what is needed without being liable to objection. Let the coherent parts be called *synsepalous*,

synpetalous, and if you please, *synandrous*, *syncarpellous*, whilst separation may be expressed by *aposepalous*, *apopetalous*, &c. Adherence arises from pressure of the circles on each other, or expansion of the torus or receptacle, so as to adhere sometimes outward on the lower part of the calyx, sometimes inward on the combined carpels, sometimes in connection with both, so as to place the fruit below the other circles of the flower and produce the epigynose structure—it readily explains many phenomena of common occurrence in flowers.

Regularity and irregularity of flowers depend entirely on the equal or unequal distribution of nutriment to the parts of the successive circles, the causes of which differences are often undiscernible, though the fact is certain. Sometimes the more developed parts are in all the circles on the same side of the flower; in other cases the opposite sides are enlarged alternately. In other instances the irregularity is produced by an opposite pair being enlarged in each circle (where the whole number of parts is even), or by this arrangement being alternated in the successive circles. It must be evident how many modifications of flowers are explained by these considerations.

The primary law respecting number is found in the tendency to the number three in the circles of mono-cotyledonous plants, and to five in those of dicotyledonous plants. The first is an ultimate law of the organization of plants abundantly established by fact, but hardly capable of being connected, so far as we can at present see, with anything else we know of their nature. It may be doubted whether the second is not connected with the first in as much as one cotyledon or primordial leaf is found to imply a circle of three parts, two would therefore be expected to produce six, but this supposes the combination into one of two circles of three. Now we have other examples of this sort of combination of circles of parts exhibited to us by certain anomalous flowers, in sufficient number and variety of cases to suggest a sort of rule as to what is likely to happen, and from them we infer that in ordinary cases one part would be lost in the union. That under considerable pressure a part would be lost at each point of junction or two in the combined circle, whilst very close position, with circumstances unfavourable to development, such as give us occasional examples of two and one part in a monocotyledonous plant might occasion any of the lower numbers to occur in a dicotyledon. I found the explanation here given of the prevailing number of dicotyledonous plants on the careful examination of a considerable number of those monstrosities, not

of very uncommon occurrence, in which two flowers are combined into one from their origin, owing to their buds having been adjacent. I can now distinctly recall examples in two or three species of *Iris*, and in at least three species of *Oenothera*, my cultivation at one period of numerous species of those genera affording me the opportunity of observing the anomalies to which they are liable. I had various instances of circles of five in the monster *Iris* and of seven in the *Oenothera*—one instance of four in the *Iris* in a single circle and one of only three, the exterior circles having five, and the tube showing sufficient marks of the union. In the *Oenotheras* observed, which embraced several species, there were uniformly seven parts in each circle, that is, seven sepals, seven petals, fourteen stamens and seven carpels. I gave some account of these monstrosities to the Linnæan Society in 1839, and it has since occurred to me that they establish a law respecting the combination of circles of growing parts, which may explain the tendency to the number five in Dicotyledonous plants, since, when growth is carried on from a single cotyledon, we find the number three in the circles, and where there are two cotyledons we might expect the circle to be double, but the fact of the loss of at least one part in combinations of two circles on the same plane shows why the number five takes the place of six. The liability of the natural numbers, five in Dicotyledonous and three in Monocotyledonous, to be reduced by mere pressure or by irregularity, is obvious from what has been already said. We find by observation that the number of parts in the successive circles of the flower is usually equal, but that the inner circle, being exposed to greater pressure, is apt to have fewer than the others—three and two carpels being very common in Dicotyledonous plants. In some structures the numbers in the different circles do not at all correspond, but this, which is characteristic of particular families, is less common, and its origin is one of the most obscure and dubious points in the theory of the flower. When parts are absent either from pressure or irregularity, we must remember that the fact is due to a special cause of abortion, not to the total absence of the part from the structure, and consequently that circumstances may occur from more abundant or equally distributed nourishment, which may in anomalous examples restore the missing part. Such examples are, indeed, almost needed to confirm our judgment as to the causes of the ordinary absence of these parts, and have therefore great interest for the philosophical botanist. In the natural family of the *Onagraceæ*, to which the genera *Fuchsia*

and *Oenothera* belong, the reduction by pressure of the natural number to four instead of five, and sometimes to a smaller number, is characteristic, but it is by no means uncommon to observe the restoration of the fifth part in both *Fuchsias* and *Oenotheras* under high culture, and, when it occurs at all, it takes place uniformly through all the circles. I have seen various examples in both genera. In the great order *Fabaceæ*, the Leguminous plants, a single carpel from abortion through irregularity of the rest of the circle is characteristic, but I have often met with kidney beans with two opposite carpels united by their edges so as to remind us of the maple fruit, and in *Acer Pseudo-platanus*, the Sycamore, I have found, instead of the usual pair of carpels, a complete circle. We are thus forced to admit that the parts deficient in particular structures are absent through abortion, but were rudimentally present in the bud, capable under favourable influences of being developed.

In fact the number five is very common in the exterior circles of Dicotyledonous plants, less so in the gynœcium, though often occurring there also; four is often produced both by pressure and by irregularity, three is occasionally found, and two rather more frequently, whilst in cases of the least amount of development, where the circles are reduced to two, or even one, a single organ in that circle is all that appears. In monocotyledonous plants the number three, and, from additional circles, its multiplies, is somewhat more constant, but abortion or degeneracy of organs from irregularity, is found throughout the Musal and Orchidal alliances and in grasses; and other irregularities of number occur. Our general laws of Floral structure, once understood, leave little difficulty in recognizing the proper explanation of the facts as they fall under our notice.

Having now shortly reviewed those principles which may be regarded as admitted among those botanists who apply themselves to the theoretical relations of the flower and its organs, tracing what is common and accounting for what is varied in the different structures, and having ventured to add one or two suggestions for improving these views or the mode of expressing them, we are prepared to estimate the evidence for any additional principle, where we have to judge whether the phenomena are susceptible of good explanation by the aid of those already established, or really require some new generalization for the correct expression of what occurs, and the perception of its true relations with other facts—and then whether the proposed principle agrees

with and harmonises all the facts so as to be received as what we call a good explanation of them. The kind of facts which *chorisis* undertakes to explain are cases in which the symmetry of the flower as commonly understood would suggest the expectation of one organ, but we actually find two or more, and these in an unusual degree of proximity; cases in which the multitude of apparently distinct organs produced in close proximity seems inconsistent with the supposition of their belonging to successive circles; those in which a number far exceeding the natural number seems to be found distinctly in one circle, and those in which a number of similar organs are combined at their base in clusters, the number of clusters corresponding to what might have been expected to be the number of organs. All these are represented as being capable of explanation by collateral chorisis or the subdivision laterally of one organ into a number of organs. There is also a different class of facts, such as the occurrence of organs arising on the face of other organs and opposite to them: sometimes of lines of opposite organs, which being supposed inconsistent with other principles of structure, are explained as cases of *transverse* chorisis, or the division of a single organ into folds like the splitting of a card into two or even many similar or related organs. It cannot be denied that the cases to which chorisis has been applied as an explanation are attended with some difficulty, and that some of them are even incapable of plausible explanation by previously established principles. Some of them, however, appear to me quite consistent with those principles, as I shall endeavour to show when examining some alleged examples, and although it cannot reasonably be affirmed that such an operation as chorisis is inconceivable as arising from the nature of the organs of the flower, and it seems even to be sanctioned by some facts, yet I find myself obliged at least to limit its application within much narrower bounds than some able botanists have assigned to it. My reasons will be best given in an examination of the particular cases brought forward at least a sufficient number of them to justify a general opinion on the subject. I shall take the examples given by Dr. Gray, who adopts fully the theory of chorisis in his valuable work, the *Botanical Text Book*, pp. 250-255, having reference also to his remarks in "The genera of the United States Flora, illustrated." Dr. Gray's first example of collateral chorisis, on which he is disposed greatly to rely, is found in the Tetradyamous stamens of the natural family *Brassicaceæ*. This case I considered at large in a paper read before the Cana-

dian Institute in Feby. 1860, and published in Vol. V. of the "Journal", p. 382, to which I now refer. I accept the quaternary symmetry in Brassicaceae, but consider the two lower stamens as part of an exterior circle of which two glands frequently present represent the other two members. I see no pretence for regarding the two pairs of stamens as each representing one divided organ, and I explained in consistency with my own view all the facts produced. Dr. Gray's second example is found in the androecium of Fumariaceae. This consists apparently of six stamens in two groups of three each, and Dr. Gray regards them as really two organs, each divided into three by collateral chorisism. It is to be observed that the two lateral stamens of each group have one anther each, while the central one has two. This suggested the theory of DeCandolle, supported by Lindley, that there are really two pairs of stamens, but those which were in the direction of the lateral pressure are split into halves, one half of each being pushed close to the stamens of the other pair, so as to place the perfect stamen of each end between two half stamens divided from the other pair. The Brassicaceous monstrosity recorded in which an outer stamen is split so as to resemble two each with a single anther, greatly supports this explanation which is favored also by the separated anthers, one on each side the column from the single stamen of many Orchidaceae and the instances of widely separated anthers with a partially divided filament. On this supposition there may be said to be a chorisism, but it is one of the most intelligible kind as there is no creation of an additional anther or of anything more than is present in the undivided stamen. It must be remembered that as chorisism is assumed to be a division from above, the three stamens in *Dicentra* being often quite distinct below and only coherent in the middle is very unfavorable to, I should almost say absolutely inconsistent with Dr. Gray's theory, and whilst this example is before us it is vain to appeal to the more complete union in other Fumariaceae, as it is an obvious case of coherence.

Dr. Gray's third example is one of those cases which appears to me to justify the admission of the principle of chorisism as occasionally giving us a satisfactory explanation of structures which without it seem incomprehensible. He refers to the three groups of stamens each completely united at their base in *Elodea*: justly observing that though the two outer circles in this flower are pentamerous, the inner ones three in number, the carpels, the three groups of stamens, and the three glands are trimerous so that each group of three connected sta-

mens represents a single organ. The same is true of the organs seemingly representing abortive clusters of stamens in *Parnassia*, and the observation of Duchatre as to the development of the numerous stamens of *Malvaceae* from small protuberances representing the single stamens of the original circle may be confirmed by any one who will examine with attention half-double *Holyhocks* in which intermediate states are found between bunches of stamens and unfolded petals.

The close bundles of stamens in *Ricinus* and the fan-like groups in some *Myrtaceae* may be of the same kind. Admitting then, the principle to a certain extent, we need not multiply examples. The difficulty is that, supposing the scattered parts of a vascular bundle which forms the leaf to supply the filaments of a bundle of stamens, we should anticipate the divided expansion giving only one cell to each anther, as is the case in *Malvaceae*, but in other cases referred to we have two-celled anthers resulting from the divided leaf, a real difficulty without doubt, yet not sufficient, perhaps, to overcome the reasons in favour of the theory.

Transverse chorisis is quite a different thing and far more incredible than what has thus far been discussed. The leaf of a *Horse-chestnut*, a *Virginian creeper*, or a *Lupin*, occurs to us as a ready illustration of the possibility at least of collateral chorisis, and it being satisfactorily proved that an ordinary stamen is but a leaf developed under peculiar circumstances, a leaf becoming a group of connected stamens cannot seem entirely opposed to our reason, each portion of the leaf has its own vascular bundle to form the filament and its own cellular expansion to form the anther. But when we are told of that which is but a thin lamella of organized substance, with its two surfaces differently constructed, and its intermediate portion quite distinct from both, splitting in planes parallel with its surface so as from the one to produce a number of similiarly expanded organs possessing the same general structure as the undivided organ would have done, we may well exclaim against the extravagance of such an assumption, and we try in vain to think of any thing which appears to justify it. A carpel is but a leaf in a peculiar state of development, and as it advances towards maturity as a fruit, we can often separate in a direction parallel with its surface three portions, the epicarp or outer surface, the mesocarp or vascular and intermediate portion, and the endocarp, the inner lining of the fruit corresponding to the upper surface of the ordinary leaf; but these three parts though often separable in fact,

and always in idea could none of them exist as living parts without the others, they are different portions of one organized substance, and the consideration of the sense in which they are different, only the more impresses us with the impossibility of supposing such elements as would ordinarily produce one leaf, capable of producing, under any stimulus, many leaves standing in parallel planes, each containing all the parts of the one. But it may, perhaps, be thought that there is some other mode of representing this matter not liable to the preliminary objection here offered. Dr. Gray, who probably presents the subject as judiciously and plausibly as any one has done, and whose authority would justly go as far as mere authority ever can, is disposed to treat the question as one of fact, as if he said: it cannot be denied that examples occur of multiplication of organs opposite to one another in the flower which do not admit of explanation by their belonging to successive circles—these facts claim consideration whether we can explain them or not, but when stated, an explanation may be attempted—accordingly he begins by putting aside the theory to which my remarks above directly apply, in the words: “The name *dédoublement* of Duval, which has been translated *deduplication*, literally means *unlining*; the original hypothesis being, that the organs in question *converge*, or tend to separate into two or more layers, each having the same structure. We may employ the word *deduplication*, in the sense of the doubling or multiplication of the number of parts, without receiving this gratuitous hypothesis as to the nature of the process, which at best can well apply only to some special cases. The word *chorisis*, also proposed by Duval, does not involve any such assumption, and is accordingly to be preferred.” He adds, respecting transverse *chorisis*: “Some examples may be adduced before we essay to explain them.” I am myself disposed, nevertheless, to endeavour to understand and consider the theory proposed, and then try its application to the facts. These facts are certain phenomena in flowers which are, if possible, to be brought under general laws of structure. Is it certain that laws previously known do not apply to them? and if this must be admitted is the hypothesis called transverse *chorisis* the only possible one, and does it answer fully the requirements of the case? These questions we can only answer when we know what the hypothesis is—what supposition respecting the origin of the parts is adopted. That of Duval is quite intelligible, and in the case of collateral *chorisis* seems reasonable, applying well to some of

the cases, and supported by some good analogies. In respect to transverse chorisis, it appears to me inconsistent with what is known of vegetable structure and, as Dr. Gray concedes, unsupported by any analogy. But let us inquire what explanation Dr. Gray himself offers and then we can try his hypothesis by the facts. I regret that the *Journal of Botany* not being within my reach at Toronto, I cannot now recur to the paper to which he refers, but the substance of his own view is that the analogue of the floral parts referred to transverse chorisis is found in the ligule of grasses and the stipules of other plants, he does not think the supposition of axillary organs in the place of buds necessary, although he holds that an axillary bud might be restricted to the development of a single phytion, and thus produce organs in the situation expressed by transverse chorisis. Nothing impossible or antecedently very improbable can be alleged against these suppositions. Some recorded monstrosities even encourage our resort to them, but I cannot perceive either of them to be at all needed in some of the examples appealed to, and it is manifest that neither would afford the smallest assistance in explaining cases of many opposite organs occurring one within another; yet in replying to Dr. Lindley's arguments against chorisis, referring to his forcible appeal to the case of certain varieties of *Camellias* in which the organs of successive circles become opposite, Dr. Gray says, "Now, when in the very same species, two such different modes of arrangement occur, is it not *a priori* more probable that the two arrangements result from different causes and are governed by essentially different laws?" I think not. The same organs are present in both cases, and either a diminution or a small increase in the spiral tendency of growth would change the usual alternation into the occasional oppositeness without any thing occurring at all inconsistent with known facts; but if Dr. Gray would receive the opposite petals of these *Camellias* as an example of transverse chorisis, it is at least one which his own mode of explanation could not possibly reach, and which on any principle yet proposed, must appear most extraordinary. Let us now consider a few examples of transverse chorisis by which we may judge whether there is any need for the name or for any new principle applicable to these cases. "A common case," says Dr. Gray (*Bot. Text Book*, 4th ed. p. 253) "is that of the *crown* or small and mostly two-lobed appendage on the inside of the blade of the petals of *Silene* and of many

other Caryophyllaceous plants. This is more like a case of real *dédoublement* or *unlining*, a partial separation of an inner lamella from the outer, and perhaps may be so viewed." But the close relation of the petal to the stamen, and the many instances of a condition intermediate between the two are well known, and it seems easy and natural enough to regard the crown as an imperfect development of anthers whilst the expansion above it corresponds with the petal-like enlargement of the connective in some stamens, and the claw with the filament. Here then, we need no new principle, and find no real exception to recognised laws. The appendage to the stamen in *Larrea* and other *Zygophyllaceae* is perhaps as good a case as can be found for the application of the stipule theory which has here not a little plausibility, although when we consider the modifications of development in a single petaloid organ as shown in *Ranunculus* with its petal scales, *Helleborus* with its nectariferous cup; some species of *Lilium* with their protrusions on the surface, and again the cases among the grasses of awns which are the midribs of the glumes or paleæ to which they belong, departing at some distance below the apex, we, perhaps, ought not to consider the appearances as inconsistent with the supposition of one organ developed in an unusual manner. Perhaps the appendages at the base of the anther in *Erica* are quite as strange as if they occurred at the base of the filament, and the stamen growing from the extremity of a petaloid process in *Campanula* not much less anomalous than if it rose from the same lower down, or at the base. Then we have the stamen of *Asclepias* with its extraordinary appendages which is as like the unlining of an organ as anything we are acquainted with, yet undoubtedly is no more than a mode of development of the one modified leaf.

The next example is taken from the genus *Parnassia* with its curious and beautiful appendages [nectaries of Linnæus] opposite to the petals immediately within them, and thence inferred to be derived from them, or, as it were, a part of the same organ. These appendages may be some justification of collateral chorisis though the multiplication of parts is incomplete, but I confess I can find no reason for denying them to be a circle of parts originating distinctly in the torus, although they are placed opposite to the exterior circle. I have given reasons for believing that oppositeness alone is no argument for identity of origin in organs, and if it were, the fertile circle of stamens in *Parnassia* must be accounted only a transverse chorisis of the carpels, as the members

of these two circles are also opposed to each other. The case of the group of stamens with the petaloid scales behind it in the American Linden seems very closely to resemble that of the clusters of stamens, in that instance coherent, of Malvaceae in a half-double flower; of the latter we have the separate petals partially developed as clusters of stamens, and we observe that they are not flat or merely curved, but nearly funnel shaped or folded round again. Let a small portion assume the leaf-like aspect and the rest subdivide into separated stamens and we have a remarkable instance of collateral chorisis in an organ so curved in figure as to produce the very appearance exhibited.

These examples probably include all the varieties that would afford anything special from which to reason, and further details would be unsuitable in this place. I conclude, 1st, that chorisis or the division of a single organ into two or more similar, or approximately similar ones, is a possible and reasonable supposition, and accounts well for a class of facts which the laws of structure previously established did not properly reach. 2nd, that chorisis does not admit of being divided into two kinds, collateral and transverse; that the latter kind as explained by Dunal, to whom we own the theory, is liable to most serious objections, and is not justified by any facts necessarily implying it, or strictly analogous with it; that the explanation adopted by Dr. Gray takes the case entirely out of the formation of separate organs from a single one; and that oppositeness of parts in adjoining circles is no indication of those parts being of common origin or belonging to a single organ, so that transverse chorisis may be entirely set aside. 3dly. That the ingenious and distinguished authors who have proposed and defended the law of chorisis have been led to apply it in various cases which do not really come under the law, and are better explained on other principles, particularly that there is no chorisis in Brassicaceous flowers, and that a number of organs really derived from several distinct circles may be so pressed together as to form one apparent circle, the parts even being connected by a common expansion derived from the torus, so that a number of crowded parts however regularly set is no proof of chorisis.

With these restrictions I receive chorisis as an additional principle in the structure of flowers, affording us valuable assistance in bringing them all, however varied, within general rules, and manifesting their common relations.

ON ERRATA RECEPTA, WRITTEN AND SPOKEN.

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(Continued from Vol. X. p. 232.)

IV. VERNACULARISMS.

All that a man of one language can do, when foreign words and phrases fall upon his ear, is to extract from them such a meaning as he best can, according to the principles of his own solitary vernacular. The English sailor deduces strange meanings from the sayings of the Dutch and Chinese; and the Dutch and Chinese probably interpret, in a manner equally odd, the words of their eccentric British friend. The Chinese indeed, we know, have made out of our English tongue a dialect of their own, which is now even adopted by those who trade with them. At Hong-Kong and Canton grave British merchants, in conversation with Chinese, seem suddenly to fall into a premature second childhood, and to indulge in the infantile babble of the nursery.

In all ages a certain amount of intercourse, somewhat like this, must have been carried on between different races and tribes; and it can easily be seen how a complete misunderstanding on both sides may in some instances have arisen; and how singular blunders may have been transferred from one tongue to another, and at length incorporated in the languages of nations as vernacular expressions authorized by custom, however wrong in their first use.

Traces of such international misconceptions are observable in numerous common terms, but especially, as was to be anticipated, in the names of peoples and tribes, of countries, cities and particular localities, of kings and distinguished personages, as handed down to us by annalists and historians.

Sometimes names that have a real significance become, when vernacularized in another language, simply conventional; while, on the other hand, names that seem conventional, or the etymology of which is not perceived, assume a meaning quite foreign to their actual import. Sometimes, again, when a meaning cannot be forced into the whole name, a syllable of it is made to give out a vernacular sound;

and sometimes a term is only simplified by clearing it of harsh consonants or modifying it according to philological law.

The Alemanni, rendered familiar to us by Tacitus, have given in French and Italian a name to a large portion of central Europe. In French, as we know, Germany is *L'Allemagne*. In Italian, it is *Alamagna*, popularized into *Lamagna*, conveying to the uninstructed ear the idea simply of great size. Alemanni, nevertheless, was no national name, but the sound caught by the Gallic or Roman soldier, when some boastful prisoner from the farther bank of the Rhine asserted, in his hearing, that his people were either all true men, all brave warriors, or else that they were congregated from all parts of the interior. Again: along the Danube, it would be gathered by the men of the legions from Italy, that the banded hordes with whom they came in immediate contact, called themselves *Marcomanni*. This expression is entered on the tablets of the Roman officer as a national or tribal name; although its real significance in the barbarian mouth was "men of the border," "guardians of the march." Their tribal designation would be quite a different thing. The elementary books on English history, in use a few years ago, failed to apprise the student that *Mercia* was the March-land, and the *Mercians* the people of the March, i.e. as between the earlier Saxon settlers and the Celts whom they were displacing. And it is not every one that is to this day aware that "letters of marque" are strictly an authority to harass the enemy beyond the limits of the frontier.

In forming the word *Germani*, the Romans were probably influenced as well by a kind of analogy of sound between it and *Romani*, as also by its welcome identity with a vernacular term of their own signifying "brothers." In this his effort at self-satisfaction, the Latin etymologist was happier than the modern Englishman who barbarously vernacularizes Moslem into Mussulman, and sometimes, with greater cruelty still, pluralizes that into Mussulmen. *Germani*, again, is, in reality, no common national name, but a descriptive term, (*wehr-mann*, warrior, man of war)—formed from the boastful reply of some indignant brave to the questionings of his captors.

According to Tacitus, in his report of the ancient German songs and ballads, the founder of the ancient Teutonic race was *Mannus*. Here again we have a simple Latinization of *Man*, and a curious parallel to the practice of other early and doubtless cognate races, of embodying under a somewhat similar term a type of themselves in

their own first condition of society. It is thus that the venerable names have descended to us, of

“Menes and Minos, Numa and Manon.”

The *Picts* were generally supposed by the early historians to have had their name from their painted bodies, although it was not explained why they in particular should be so designated when the barbaric fashion to which allusion was supposed to be made, was by no means confined to them. The Picts are now held to have been “pic-tith,” marauders, an epithet conferred on them by their Gaelic neighbours. Their true national name is said to have been *Cruitnich*, Corn-eaters.

The national name of Ireland was vernacularized into Hibernia in Latin, a sound in *Ierne* being caught at by the Roman soldier, as comfortably suggestive of winter-quarters (*hiberna*).

The Langobards of the north of Europe as well as those who at a later period gave name to Lombardy, have, almost as a matter of course, been described as distinguished for the length of their beards, although in all probability it was the length of their spears, in their own dialect their *barts* (compare *halberts*), that was remarkable. That in rude times names were attached to bodies of men from the fashion of their arms we know; for it was thus that the Ojibway came to speak of the Englishman as *Jaganash*, ‘the man with the long knife,’ meaning his sword, (unless in this case we have combined an accidental vernacular propriety of sense with an effort to pronounce the difficult word “English.”) In a similar manner, *Saxon* is reported (*e. g.*, by Kohlrausch) to be from *saks*, a short sword.

Like *Aleman*, *Frank* has been transformed into a well-known national name. But Frank, in its first use, denoted simply a tribe retaining its freedom as distinguished from those of its kin who had been subjugated by a stronger power. (Frank is held by some, however, to be interpreted as a derivative of *frak*, the root of *ferox*.)

The name *Saracen*, a stern reality to our ancestors of the crusading times, a term of romance only to us, was no true proper name of a people. It was, by the customary misunderstanding, a collective epithet used as such. It actually means “people of the East,” from *Schar*, Arab., “the East.” In Latinizing *Scharakajim*, natives of the East, into *Saraceni*, we had a specimen of the simplifying process by which, as in numerous other interesting examples which might be named, oriental words were conveniently adapted to the

vocal organs of the western nations. By this process the old Persian *Khshayarsha*, *rex venerandus*, became *Xerxes*. Other instances are these: *Artaxerxes* from old Persian *Artakhshatra*, (*arta* intensive, and *Khshatra*, king.) *Darius*, old Persian *Daryavush*, *Dominus*, the possessor. *Darius*, like *Ahasuerus*, *Pharaoh*, &c., is a title, not a name. *Hystaspes*, old Persian *Vishtaspa*, possessor of horses. *Mardonius*, old Persian *Marduniya*, warrior. *Cambyses*, old Persian *Kabujiya*, eulogist or bard. *Cyrus*, old Persian *Kurush*, the sun. *Astyages*, *Ajdahak*, the biting snake. *Zoroaster*, *Zarathrustra*, golden star.—As later instances, add *Sapor* from *Shah Pour*, *Chosroes* from *Khusru Parvez*, *Assassin* from *haschischim*, *Hunni* from *Hiongnu*, *Hungary* from *Hungri*, *Ungri*, *Ugri*, *Uhor*, nomades, vagrants. *Saladin* is *Salah-ed-Din*. *Averrhoes* is *Ibn Roshd*. The *Cid* is *El Seid*. *Prester John* is *Prester Kahn*, the great Khan *Quang* of the Keraites, who was reported to have been converted to Christianity. In the mediæval period, *Akka* in Palestine was transformed into *Acre*—an instance of an unnecessary vernacularism becoming at length a spirit-stirring, historic word, and the source of several family names.

The Phœnician terms *Petuli*, contention, *Voseveer*, place of flame, and *Evoron*, blindness or darkness, became *Putcoli*, *Vesuvius* and *Avernus*. The latter by the Greeks of the neighborhood was adroitly interpreted to be *Aornos*, birdless.

The Etrurian *Tarchinia* the Roman wrote *Terracina*; and *Aequiculi*, one of the forms of *Aequi*, the well-remembered associates of the *Volsci*, quickly became *Aequicoli*, practisers of justice. *Orichalcum*, mountain-copper, is *aurichalcum*, gold-bronze; and *Hercle*, in the asseveration *Mehercle*, is understood, not of the native *Herculus* or *Hercus*, guardian of the Pen and Föld, but, of the son of Zeus, *Heraclēs*. The general term *Aborigines* (*ab* privative and *origo*) becomes in Festus *Aberrigines*, nomads from all quarters. Lycophron makes out of *Aborigines*, *Borigoni*, thrusting the word into the Greek compounds in *gonoi*.—*Hyperai*, certain ropes, braces of the yard-arm in the tackling of ships, were understood by the Roman sailor to be *opifera*, the help-bringers. In the dialect of Etruria, Aphrodite was *Fruti*, which became associated with *fruitus*; and the mongrel *hierospex* passed into *aruspex*, perhaps under the influence of *ara*. The received interpretation of *Rome* itself by the word of good omen, *Strength*, is now held to be a vernacularism,—a Latin Græcism, so

to speak, for *Groma* or *Gruma*, the military surveyor's staff set up to mark the centre of a proposed camp.—*Postumus*, a superlative of *posterus*, was sometimes, as in English, converted into *posthumus*, as though it expressed relation to one defunct and buried in the earth; while, in fact, it is simply 'last;' indicating, when applied to offspring, that the child is the latest born; including, especially, the case of an infant born after its father's death, or after he had made his will.—In one particular sense, *providentia* acquired the form *provincia*, with the notion included, that a *province* was an addition to an empire, by conquest.—So *duellum*, the archaic form of *bellum*, as *duis* for *bis*, was interpreted, in the time of Festus, 3rd century, A. D., as if *duo* were contained in it; and, as if it expressed, simply, what the English word *duel* does.—And, *opus Musivum* or *opus Museum*, "work inspired by the Muses," i. e., displaying taste and beauty, has come down to our time in the Italian *musarco*, and the French *Mosaïque*. In this last term, we see a blending of ideas, similar to that which, at a later period, confounded occasionally *sabaoth* with *sabbath*.—The *Fasti* of Ovid would furnish a multitude of ill-founded Latin vernacularisms were it expedient to cite more than those that are here referred to.

The infamous Emperor Elagabalus, more correctly Avitus Bassianus, or (to employ the respectable name so horribly abused by him) Marcus Aurelius Antoninus, figures in Greek writers (e. g. Heliodorus), as *Heliogabalus*, wherein the *Helio* is a vernacular effort to express the whole sense of *Elagabalus*, a name of the sun-god worshipped at Emesa; a name, however, having no reference to *Helios*, but to *Elah-Gebal*, an aerolite, preserved and venerated as a fetiche in a temple of that city.—The Hebrew *Kishon*, literally "bent," the "ancient river" now known as the Nahr Mukutta, becomes in manuscripts by Greek hands the river *Kisson*, the Ivy-river. In the same manuscripts the brook *Kidron*, literally "the dark," is the brook *Cedron*, the brook of Cedars. In a similar manner, Simon of Cana, Simon Zelotes, figures sometimes as Simon the Canaanite, Canaanite being the more familiar term.—Bozra, the ancient site of Carthage signified in Phœnician, *town*. The Greeks chose to understand the word in their own way, and to call it *Byrsa*. Then followed a story to account for the name. One of the summits of the Capitoline Hill in Rome is covered at this day with the buildings of a Church and monastery bearing the title of the *Ara Celi*. We have here an ancient

Latin vernacularism originating in *Arce*, i. e. the *Arx* or citadel which once stood on the same spot.—The Capitoline Hill itself is popularly known as the Campidolio, the oil-field. Finally the famous Amphitheatre of Vespasian, commonly spoken of as the Coliseum, was, at least in the middle ages, designated the *Colosseum*, the place of the Colossus, the former site, that is, of the Colossal statue of Nero.

It was not my intention when I began this paper to dwell at any length on such vernacularisms as those which I have just been noticing—vernacularisms to be detected in tongues now little known or passed entirely out of use. I desired to discuss principally a few verbal curiosities of the kind indicated, which I have happened to observe in our own common speech and in one or two cotemporary foreign languages. To them I now proceed.

1. And, first, let us take some names of plants or vegetable productions. It will not be necessary to make any remarks upon ordinarily-quoted and very obvious examples. I therefore dismiss at once *rosemary* from *ros marinus*, *tuberose* from *polyanthes tuberosa*, *foxglove* from *folks'*, i. e. fairies', *glove*, *liquorice* from *glykyriza*, *mandrake* from *mandragora*, *dandelion* from *dent de lion*, *hollyoak* (a wording to Lord Bacon) from the Anglo-Saxon *holihoc*, *buckwheat* from *buche-wheat*, i. e. beech-nut wheat, grain of a beech-nut shape, &c. In respect of *mandrakes*—there is, in "Sir John Oldecastle," a play sometimes attributed to Shakspeare, an allusion to a popular notion about them. The guilt of murder, it is there said,

—— solicits Heaven
With more than mandrakes' shrieks.

From *mandragora* has sprung the elaborate French vernacularism, *main de gloire*. I pass on to specimens of less notoriety.

When we enunciate the names of the well-known common flowers jonquil, gilliflower, daffodil, periwinkle, or of the herbs parsley, carraway, the weed purslane, or the familiar exudation from our pine-trees, turpentine, we feel at once that, if they do not in every instance convey a perfect English meaning, they are at least made up of plain English-sounding syllables, each possessing a certain degree of sense. These are all vernacularisms based on terms foreign to our speech.

Jonquil is properly the Italian *giunchilia*, i. e. the *narcissus juncifolius*. Gilliflower is, through the old French, *giloferé*, for *giroflé*, the botanical *caryophyllus*, a clove. Daffodil is a capricious Anglicisation of *asphodel*. Periwinkle is Italian again, viz. *pervinca*. Parsley is

petro-seli-num, rock-apium, rock-bee-plant of Selinus. Carraway, also care-away, is the *Carum carui*, or *Sem. Car. carui* of the druggists' drawers; in Arabic *karawaia*. Purslaine is *porcellana*, Italian once more. Turpentine is *terebinthine*, properly the gum of the *pistacia terebinthus*. To these add the *service-tree*, which is intended for *sorbus-tree*, now classed as a species of *pyrus* (*p. torminalis*), but placed by Linnaeus, along with the mountain-ash and rowan-tree, in a genus *sorbus*:—also the *Judas-tree*, which means *arbre de Judée*, tree of Judea. (The Latin translation of Bacon's Essays, art. Gardens, has for "gilliflowers" *cariophyllatec*.) A rich Malaga wine, taking its name from the brand of one Pedro Ximenes, is commonly Anglicised into *Peter-sa-mee-ne*; which our sailors take a further liberty with and call *Peter-see-me*.

Again: *nutmeg* is the Old French *noix muquette*, in modern French *noix muscade*. (*Muquette* was previously *musquette*, from *muscus*, sweet, whence also *musk*.)—A powder used in the manufacture of dyes is vulgarly called *cudbear*. Its real form is *Cuthbert*, the name, perhaps, of the first "patentee."—*Eagle-wood*, an ingredient in the composition of incense, is from *agila*, a Malayan word having nothing ornithological in it, and *aod*, a syllable from the Arabic.—The *lign-aloes* or *aloes-wood* of the druggists and cabinet-makers, is not a product of the aloe, but the fibre of the *agallochum*, to which term corrupted the first expression is due.—A corrupt pronunciation of *ambergris*, grey amber, is common. The fine Persian word *lilac* likewise suffers, in vulgar English, Anglicisation in both its syllables, *li* becoming *lay*, and *lac*, *lock*.

Quinine (in the mouths of the uneducated sometimes *Queen Ann*) is *kin-kina* (whence *cinchona*), i. e. the native Peruvian name *kina-kina*; and *percha* is properly *pertsha*, Malayan for the tree which yields the *gutta* or gum.

The *fleur de lis* or *lys* of France used some years ago to be *flower de luce*, or even *Lewis*, in English, from supposed allusion in the words to *Louis*, the name of so many of the Kings of France. (*Lis* is properly *lils*, and this from *lilium*. Thus in Shakspeare—

———"Lilies of all kinds,
"The flower de luce being one."

Louis is *Clovis*, which is a modification of *Chlotwig*, people's defence.)

2. Next let us notice the names of some of our fruits. The Persian for *orange* is stated in the vocabularies to be *narenz*; and the

Arabic *narang*. In the Latin of the 13th century this last is represented by *arangia*. Merchants and others speedily satisfied their common sense that this *arangia* might with greater propriety be *orangia*, a word conveyiug, by the sound of its first syllable at all events, the idea of a golden-coloured object.—In passing down the Rhone the traveller is interested in beholding, stretched along its left bank, the ancient city of Orange, the place from which the Counts of Nassau, early in the 16th century, by virtue of alliances by marriage, added to themselves the title of Counts of Orange. But here, in this local Orange, the vernacularizing process has taken effect, not upon the Persian or Arabic name of a fruit, but upon the Latinized name of an old Celtic city, Arausio. Out of the coalescence of these two separate vernacularisms into one has arisen the name of a third thing, viz., of a colour destined to hand on to the present day and to far continents a specimen of the power over the unreasoning many, of association in relation to the hue of a riband or a flag; a study by the aid of which, as by that of some minute fossil of a by-gone era, we can the more easily realize the proceedings of the factions of the Hippodrome and the feudal strifes within the mediæval cities. The modernized local name of Orange on the Rhone had, very probably, its weight with the French traders in the Levant when they converted the Arabic *narang* into a word of more vernacular sound.—The *aurea mala* of the Hesperides are now interpreted to have been simply oranges, which, when very rare, were regarded as rather mysterious curiosities, just as the eggs of Ostriches used to be. In the time of Friar Jordanus (circa 1330), the orange was not known in Southern Europe. He describes those he saw in India as “lemons sweet as sugar.” (Vide his *Mirabilia*, p. 15.)

A species of pear is familiarly known among us as the *bon-crétien*, “the good Christian;” a singular name for a fruit. It is a French vernacularism for the Greek word *panchresta*. The *poire panchresta* means “the unexceptionable, every-way excellent pear.”—Again, the apple called the *rennet* bears in reality also a French name; but we have compelled it to sound English. It is properly *rainette*, “the apple mottled like a frog.”—The *genneting*, or as Lord Bacon gives it, the *geniting*, is a departure from either *June-eating* or *St. Jean-eating*; if it be not, as has been suggested, the Scottish family name *Janeton*.—A fruit not much heard of among us is the *medlar*; but its name is not unfamiliar, through a proverbial reference to the fact that it is only then fit to eat when it is in a state of decomposition.

This word we have vernacularized from *meslier*, a French transformation of *mespilus* or *mespilum*, the classic name of the same fruit.—*Berberis*, the botanical Latin for a well-known ornamental and useful shrub growing in abundance wild on the New England coasts, we have adroitly made *barberry*, catching at the sound of the last two syllables. The original of the term corresponds to the Arabic name of the shrub.—The Anglo-Indian *jack-fruit* is an obvious modification of the native *tsjaka* and *iaca*.

8. The appellations of animals, of fish and of birds, of insects and various creeping things, furnish instances of vernacularized terms. I take first the case of the *Muscovy duck*. Muscovy knows little of him. His home is Nicaragua. He has his name from a tribe of Mexican Indians, the *Myscas*. He was at first known as the *muscoca*, then as the *musco* duck. Finally, Muscovy being a name more familiar than either of the other two to the British ear, he became the *Muscovy duck*.—Again: the syllable *prey* in *osprey* has a good predatory sound. The Latin name of the creature is literally the *bone-crusher*, *ossifraga*. The French have vernacularized it into *orfraie*; we, into the word of the satisfactory seeming just mentioned. To our unsophisticated forefathers, *caterpillar* very probably appeared a well-selected appellation. It hinted of insects somewhat cat-like, whose habit was to “pill” and lay waste. But the element *-pil-* has reference to the *hairiness* of caterpillars. In the Italian of Lombardy the silkworm is *gatta* and *gattola*, “little cat.” (*Chenille*, the French for caterpillar, is “little dog,” *canicula*.) In Spanish it is *fel-pilla*, *felis pilosa*, good Latin corrupted. In Norman French this became *chatte-pelouse*, which we vernacularize into “caterpillar.”—In the first instance, we see, it meant the silk-worm only. In connection with “cat,” I may mention that in the Walloon, i. e. the Flemish spoken between the Scheldt and the Lys, the name of this animal is said to be *pisice*, which may originate what Archbishop Whately called the English irregular vocative of “cat.”—In the same connexion I add that *scate*, the name of a not unfamiliar fish, is properly “sea-cat” pronounced short. Its Welsh name is *morgath*, which is, to the letter, “sea-cat.”

The monastic annalists had alarming ideas about *cockatrices*. In heraldic zoology these beings still exist. It appears that *crocodiles* were meant. The Low-Latin word was *culcatrices*, whence came the Italian *culatrice*, the French *cocatrix*, and the English *cockatrice*. The emblazoners of arms, carried away by a vernacular sound, figured

the animal accordingly. Friar Jordanus reports that in Ind'a the Less, i. e. the neighbourhood of the Indus, "there be also coquodriles which are vulgarly called calcatrix; some of them be so big that they be bigger than the biggest horse. These animals be like lizards, and have a tail stretched over all, like unto a lizard's; and have a head like unto a swine's, and rows of teeth so powerful and horrible that no animal can escape their force, particularly in the water." (*Mirabilia*, p. 19.)—*Apropos* of lizards,—*alligator* for *al-ligarto*, THE lizard *par excellence*, is well-known. *Lizard-point*, on the Cornish coast, is said to be from *liz=cape*, and *ard=high*. In like manner, dormouse for *dormeuse* (*la souris dormeuse*), John Dory for *jaune dorée*, belfry for *befroi*, bellwether for *bélier*, i. e. *vellarius*, are vernacularisms too familiar to detain us here.—The name of the hawk (Lat. *accipiter*) has been curiously vernacularized in Italian into *astore*, which in the popular mind is supposed to imply that it is "the bird of Asturia." In Spanish and Portuguese it has become *azor*, whence the name of the *Azores*.—The *shual* (rendered "fox" in the English translation of the Hebrew Scriptures) has become a household word under the vernacularism *jackall*. We can easily see what was the transition-term to this very English-sounding word. It was, no doubt, the *ciacales* of Busbequius. He thus describes them:—"Lupi sunt, vulpibus majores, communibus lupis minores; voracitate tamen edendique ingluvie pares: gregatim incedunt; hominibus armentisque innoxii, furto magis et dolo, quam vi, victum quærentes: ab harum ferarum ingenio Turcæ, homines fraudulentos et versipelles, maxime Asiaticos, *ciacales* vocant." (P. 78, ed. Elzevir, 1660.)

A familiar, and even proverbial, word with our grandfathers was *popinjay*. This is *babagâ*, the Arabic for "parrot." The Mediæval Greeks made out of it *papagas*, and the French *papagai*. We, after our English manner, turned it into *popinjay*. The modern Greek is *papagallos*, with the notion implied that the bird so designated is a favourite pet with priests (*papas*). Hence the name is, *quasi* "the abbé's delight."—The gay costumes of mingled orange and scarlet, distinguishing the Swiss guards who lounge in the porticos of the Vatican, are strangely suggestive of this bird and its plumage. Many an Italian Hotspur has possibly found "popinjay" rising to his lips, as he eyed them.

4. Take, next, examples of vernacularisms in implements, fabrics, household stuff, &c.

Carpenters have a tool which they call the rabbet-plane. Its name has come from *rabot*, the French word for a plane. *To plane* is *raboter*. It describes the action of the arm while the operation is going on. It is the Italian *ributtare*, to thrust against or back, affected by *rabattre*. (*To rebut* is to thrust back.) There is a machine for giving a gloss by pressure, called a *calender*; in French, *calandre*. It gave to Gilpin's benevolent friend in Cowper's ballad, a title which sometimes puzzles young readers. "Cylinder" was a term too scientific for the artisans of a former day. It accordingly took on a sound more familiar. In French, "calandre" is identical with the name of a kind of plover.—In like manner the peculiarly-formed compasses used to measure "calibres" have become, in the popular dialect, *callipers*. (In "calibre" verbal numismatists detect "æquilibrium.")—*Andiron*, for the now almost extinct *fire-dog*, is a singular-looking word. It is the Old French *andier*, of which the Late-Latin was *andena*, one signification of which is a "rack for the spit." Some persons please themselves by imagining that *andiron* is *end-iron* and even *hand-iron*.—The French themselves have vernacularized the word into *landier*, by incorporating the article, as they have done also in *loriot*, *lierre*, *lendemain*, *lévrier*, and possibly other cases.—When we remember the semi-transparent material formerly used in the construction of lanterns, it is not to be wondered at that the name of this "useful light" developed itself into *lanthorn*. (*Lanterna* is *laterna*, akin in root to the Germ. *lauter*, bright.)—*Damaghan*, in Khorassan, once famous for glass-ware, has been vernacularized by us into *demijohn*. The French convert it, or something else, into *dame jeanne*, a name tending to shew that our ancestors, while saluting their tall cans as *jacks*, were not so peculiar in styling lesser vessels *gills*, Gill being, as we know, short for Gilian, i. e. Juliana.—*Coverlid* and *coverlet* are both the French *couvre-lit*. *Côtelette*, "little side," we ingeniously naturalize into *cutlet*.—*Counterpane* expresses the notion of symmetrically-arranged squares. It is the French *contre-pointe*, *courte-pointe*, and *coulte-pointe*, vernacular graspings, all three, at the Latin *culcita puncta*, a soft quilt-ed appliance to be spread upon a couch.—Out of *hamac*, the native term for what we call a *hammock*, the Dutch have contrived the descriptive vernacularism *hang-matte*.

If not "from China to Peru," at least from Ireland to Cashmere' local names have given us vernacularisms for fabrics of the loom and

other material. Thus, while the last-named region has given us, *kerseymere*, and the French, *casimir*, *drugget* is said to be due to *Drogheda*. Intermediate points have done similar service. For example, *Cyprus* is the source of the old word *cypres* or *cipresse*, for *crape* (Fr. *craſpe*).

“Come away, come away, Death,
And in ſad cypres let me be laid.”

—*Shakſpeare*.

“Flowing, with majeſtic train,
And ſable ſtole of cypres lawn.”

—*Mit. II Penſeroſo*.

The word has been transformed by modern editors into the leſs dubious ſhapes *cypress* and *cyprus*.—*Canopus*, the luxurious city of the Nile, has probably affected the orthography of “canopy.” It ought, according to its etymology, to be “conopy,” from *cōnōps*, a mosquito. A canopy is, in the firſt inſtance, a bed provided with a mosquito-net.

From the French *moire*, *luſtre*, *ruban*, we have invented *mohair*, *luſteſtring*, *riband* and *ribbon*. Even the *buff*-jerkin of our forefathers was a vernaculariſm from the French, and had reference to the animal out of whoſe hide it was made; the conſumption of whoſe fibre is ſuppoſed to contribute ſo largely to the national energy.

Galoshes, vulgarly ſometimes *gallo-shoes*, are, through the French the Late-Latin *calopedia*, a vernaculariſm for the Greek *kalopodia*, i. e. ſabots or clogs, literally “ſhoes made of wood” (*kālon* = wood); thus, *calopedia*, *calop'dia*, *galoche*. Some deduce the word from *Gallica*, *solea* being underſtood. If this did not ſuffice, a ſuggeſtion might be offered of *caliga*, “the boot of the private ſoldier,” from which Caius Cæſar Caligula had his military ſobriquet.

“Spectacles,” for “glaſſes,” is the French “beſicles” vernacularized; and “beſicles” is a popular derivative of *bis-cyclus*, a term having reference to the large circular lenses (*lunettes*, “little moons,”) formerly uſed.—In aſſociation with this word, note that “Cyclops” is a Hellenic vernaculariſm. The *Cycl-* is now declared to have nothing to do with *cyclus*, but to be rather the old word *coeles*, i. e., “blind.” (Vide *New Cratylus*, p. 254.)—“Spectacles” in French are alſo *binocles*, i. e., “binoculars,” ſomewhat rubbed. This fine ſcientific term has given riſe in Engliſh to the vulgariſm “bar-nacles.”

5. We come now to vernacularized names, technical and other terms.

The individual and family names which have undergone vernacularization are innumerable, as may be seen at large in the "Teutonic Name System" of Mr. Ferguson. Names of places are also often thus transformed.

Bombay is *Bona Bahía*, Spanish, from *baja*, a bay. (Compare *Bahía*, *Bayonne*, *Bay State*.) *Groyne* and *Leghorn* are the English sailor's rendering of the *Corunna* and *Livorno*. He makes, in a similar manner, *Irish islands* and *Sick-ladies* out of *Hyeres islands* and *Cycládes*. "The Gulf of Lyons" figures on our maps, as though there were some reference in the phrase to the city of Lyons, which in French is *Lyon*. But on the French maps it is "Golf de Lion," Lion-gulf; reminding us of *Bocca Tigris*, *Bab-el-Mandeb*, ("Gate of Tears,") and other names of evil sound. The "wild and stormy steep" which a Dane would call *Helsingors*, we (or rather our fathers before the time of Shakspeare, thinking probably of their own native *Nore*,) have familiarized to our English ears as *Elsi-nore*.—Into *Tartary*, "the country of the Tatars," the *r* has crept, from a monkish association of the native word with *Tartarus*. Such writers as Friar Jordanus instilled the belief that inland desert tracts generally were peopled with demons.—In *Guadalquivir*, *Wady-al-Kebir* is forgotten. To *Cannibal*, simply a *Carib*, or inhabitant of the Antilles, we have assigned an exclusively anthropophagous sense.—*Brennen*, a mountain in the Tyrol, is a vernacularization of *Pyren*, *Pyrn*, "high mountain," the Celtic root of Pyrenees as well. The *Danejohn* of the city of Canterbury is "the promenade of the *donjon*" or old castle-keep. *Rotton Row* in London is said to be *route au roi*, "king's road."—Built on the site of a *brasinium*, appertaining to an ancient academic Hall, the mysterious *Brazen-nose* of Oxford proves to be a vernacularism for *brasen-huis*, a *braserie*, or brew-house.—At Arles, in Southern France, is a cemetery commonly known as the *Arlecamp*, and popularly understood to express its relation, as God's acre, to Arles. It was anciently, however, written *Elycamp*, whereby its first designation, viz., *Champs Elysées*, is betrayed.—Our English term *Carfax*, to be met with in Oxford and Exeter, is properly *quatre-voies*, "a place where four ways meet." On the same principle is to be interpreted the proper name *Bifax*; but *Fairfax* means *Light-haired*, and *Colfax*, *Hazel-haired*. In *débonnaire*, i. e. *de bonne aire*, as well as in the phrase *de gentil aire*, the *aire* is a descendant of *arvum*, equivalent to *ager*, in

the sense of "landed property." Through the tendency to get at a set purpose, "St. Peter's eye," i. e. island, on the Thames, has become world-wide renowned as "Battersea." The same tendency here in Toronto turns our "Bathurst-street" (vulgarly and even in a printed advertisement,) into "Batters street."—The river Rapidan, famous in the late United-States troubles, sounding as if it contained *-aan-*, the element noticeable in *Eri-dan-us*, *Dan-ube*, *Don*, and other river-names, is nothing more than *Rapid Aan*, a name commemorative of the good English queen.

Our own *Anticosti* is a French vernacularized form of the aboriginal name, *Nantiscotec*. *Ha-ha bay*, perhaps, expresses surprise; like the term, *ha-ha hedge*. It is a singular sinus, or side-loop of the River Saguenay; which, at a first visit, might easily be taken for the main stream. (The native name is given, but without interpretation, as *Heskaewaska*. That of the Saguenay, also, *Pitchitanichetz*.) In the French maps it is marked *Baye des Ha*.

A curious vernacularism, in regard to an English proper name, may here be mentioned, although already well-known. It occurs on a monument in the Cathedral of Florence, placed there in honour of an Englishman eulogized under the name of *Acutus*. It commemorates, however, no member of the numerous family of Sharps, as at first sight would be imagined; but, Sir John *Hawkwood*, a valiant condottiere of the 14th century. "Hawkwood" presenting difficulties to the Italian organs, it was conveniently vernacularized into a good native sound, conveying a good native sense—*Acut-o*; and so, incised on marble, it has descended to posterity. In like manner, the name of Sir John *Hawkins*, a naval hero in the time of Elizabeth, better satisfied the Spaniards when they had reduced it to the Hellenic-looking *Achines*. *Vide* Froude's "Reign of Elizabeth," where (p. 107) see, also, the remarkable expression, "the queen-dolphin's title," used of Mary of Scotland, as (up to the death of her father-in-law, Henry II.) dauphiness of France. *Dauphin*, in the French language, was a term so conventional that it startles us to see it in plain English. Like the names borne by our heraldic pursuivants, *rouge-croix*, *rouge-dragon*, *port-cullis*, &c., and somewhat like the mythic "Pen-dragon" of the era of Arthur, *dauphin* was a name accruing from a cognisance or crest, borne first by the Counts of Vienne; and then, after the transfer of their rights to the Kings of France (1343), by the immediate heir to the French throne. There are authorities who contend

that the title, *major domús*, in the courts of the Merovingian Kings, is a Latin vernacularism for the native *mord-dom*, 'judge in capital cases.' The historic 'Charlemagne,' itself, is declared, by the same investigators, to be a disguised form of the Teutonic *Karl-mann*, 'strong man.' Such readings of received terms meet with little favour. and *lambas ubhal*, according to Foster's *Perennial Calendar*, an old Saxon term, equivalent to *le messe des pommes*, i.e. *le Toussaint*, All Saints' day, November 1, became *lamb's wool* in later times, a beverage used on the festival, concocted of bruised apples, ale, wine, &c., was once 'the carles' wain,' the wagon of the churl, or husband-man. Without doubt, however, 'Charles' wain,' the group of stars so-called; Adopting a course the reverse of that supposed in the cases of *mord-dom* and *Karl-mann*, our Netherlandish kinsmen have constructed a vernacularism out of an undoubted Latin title. They have transformed *comes stabuli*, 'the count of the stable,' the original of 'constable,' into the Dutch *coninc stavel*, *fulcrum regis*, 'king's support.' Once more: from a Celtic word, *buch*=small, the Late-Latin adjective, *bacalarius*, was formed, expressive of the condition of a minor—of one not yet advanced to the dignity of master in an art or science. An ingenious vernacularizer improved this into a word blending the ideas of the ivy-berry and the bay—*baccalaureus*. Like Dom Diniz, at Coimbra:—

"Here, ivy-wreaths, with gold, he interweaves,
And the coy Daphne's never-fading leaves."

—*Lusiad*, 3, 75.

Hence has arisen 'bachelor,' in all its senses. As to its application, in the technical language of chivalry, that has been vainly assigned to the French *bas chevalier*.

Some further French vernacularisms, for which I have not hitherto found a place, together with a few similar or connected misunderstandings in English, may here be subjoined. *Boulevard* is now almost English. It is the French transformation of the Low German *bolwerke*, a bastion, or a portion of the fortifications jutting out in a circular form. We make *bulwark* and *bulwork* out of it. 'Boulevards,' in the Parisian sense, are now remarkable for the absence of that from which the word has descended. They are the open spaces left by the removal of the ancient city-walls.—The common impression is that *faubourg* is the *fauxbourg*, the quasi-city, the parts arrived at before entering within the walls. The sense of the word is this; but, reached

by another route: *faubourg* is, more correctly, *for-bourg*, that portion of the city which is *foris*, 'outside the gates.' Another, and plausible explanation, is the German *vor-burg*, the *ante-urbium*; or, *sub urbium*, the *suburb*, as we speak.

Our *causeway* (more accurately but sounding less correctly, *causey*,) we take from the French *chaussé*, which is a modification of the Italian *calzata*, i. e. in Late Latin *via calceata*, a paved way made firm and solid by means of *calx*, lime or grouting.—The English word "ball," for the French *bal*, has, in the opinion of some philologists, accidentally reverted to its original root. *Bal* is the Italian *ballo*, which is from the Late-Latin *ballare*, connected with the Greek *ballein*, the reference being in the first instance to the movements in playing the game of "ball." There is included in the term the idea of a musical accompaniment, instrumental or vocal: whence *ballad* as well as *ballet*. Strictly speaking, "bal" thus corresponds to the Latin *saltatio* and the Greek *orchesis*, exercises gymnastic and mimetic, accompanied by expressive music, and having very little in common with the modern amusement of dancing.—Our sailors conveniently interpret as "hurricane" the French *ouragan*, which is said to be a Carib word naturalized. This Anglicism, in combination with photograph, &c., has suggested to a United-States' writer the title "Hurrygraphs," for a work written, it is to be supposed, in haste.—*Maoseen*, Malayan for "year" or "season," which is probably the Arabic *mousim*, "periodical," has been converted by us into the familiar-sounding syllables *mon-soon*, further vernacularized, by Rushworth (1640), into *man-sounds*.—We have Anglicized into *shagreen* the Venetian *sagrin*, the name applied to the rough skin of the *shark*, used for purposes of friction and abrasion, itself derived from the Turkish *sagri*, applied to other substances similarly employed. As *tribulus*, "the teasel," has contributed to the Latin, *tribulatio*, so a material of rasp-like surface has introduced (since the 13th century) into the French, and even into English, the expressive "chagrin."

A burlesque French term for what we should call a "jumble" is *brouillamini*.

"Il y a la-dedans bien du brouillamini."

—*Moliere*.

It is a vernacularized word with a Latin verbal termination, having its origin in *boli Armenii*, "boluses of Armenia," "boluses compounded of a multiplicity of ingredients,"—a cant expression for the thing indicated by *brouillamini* itself.—Again: in French the *palate* is

palais, literally *palace*. Here is a confusion between *palatum* and *palatium*. *Palatum* is *palate*, with the secondary sense of "vault," from the form of the *roof* of the mouth. In this secondary sense *palatum* is applied to the *loilon*, the *celestial vault*, and is played upon by Cicero: "Epicurus, dum palato quid sit optimum judicet, cœli palatum (ut ait Emilius) non suspexit." *De Nat. Deor.* 2, 18.—Emilius lived B. C. 237. *Palatium* for *palace*, i. e. "imperial residence of the Palatine," is said not to have been in use until after the time of Augustus.—One more mongrel French term, having its origin in Latin, is *malingres*. We make of it *malingers*, "men who feign sickness." The expression really is *mal'agri*.—The residuary French of the long Latin word *codicarium* is *cahier*. It is properly a *codex*, or book consisting of separate leaves, as distinguished from a *volumen*, "a roll of sheets fastened together." *Cahier*, with us, has become *quire*, in the sense of "twenty-four sheets."—*Hochepot*, *hautes coquilles*, *chair cuite*, *potée*, *foire*, *sursault*, we render by vernacularisms too commonplace to mention. And has not *partir* something to do with the signal-flag *blue-peter*, hoisted when a vessel is on the point of setting sail? *Pologne* we make *Poland*, and *amiral* (Arabic *amir-al-bahr*, commandant at sea), *admiral*. Another Arabic designation, *targoman* for *interpreter*, we persist in calling *dragoman*, as though we found him a drawback to pleasure-travel in the East.—*Point-de-vice* is an expression used by Bacon and Shakspeare in a way exclusively English. "Mens' behaviour," the former says in his *Essay Of Ceremonies and Respects*, "should be like their apparel, not too strait or point-de-vice, but free for exercise or motion." The latter puts into the mouth of Malvolio—

"I will be point-de-vice, the very man."

Point-de-vice (so printed in the less recent editions) is understood to be 'precise, finical, over-exact.' *Point de vice*, as the phrase really is, is of course 'faultless,' 'immaculate,' 'absolutely perfect.' It is not easy to see, then, why it should have been explained in Whately's notes to Bacon's essays, p. 549, as denoting "the nicety and precision of a stitch (French *point*) devised or made with the needle."—Certain ecclesiastical addresses or homilies are called in old English *postils*. Being grounded usually on a passage just read, they frequently begin with some such phrase as *post illa*, sc. *verba*. The French have moulded the expression into a word of satisfactory sound to the common ear—*apostille*.—Another ecclesiastical term with us is *parvis*,

for a particular portion of a large church. It has been interpreted to mean the place for "the little ones," i. e. the schools. Its real form is *paradis*, i. e. *paradise*: and it denotes properly the *pronaos* or "ante-chapel." The *Parvis* of a church was a place of public resort. In a document, temp. Hen. VIII., quoted in Herbert's *Inns Of Court*, p. 217, a complaint is made in respect of the Middle Temple, that "they (the fellows) have no place to waik in, and talk and confer their learnings, but in the church, which place all the terme times hath in it no more quietnesse than the *pervyse* of *Powles*, by occasion of the confluence and concourse of such as are suters in the law."—*Carillon* is *quadrilio* modified under French influence. It is properly a set of *four* bells. The chime of eight lately put up in Toronto is thus a double *carillon*.—In other ecclesiastical terms, as in "sidesmen," properly "synodsmen," forced interpretations will be found.

The Latin and French of the Law Courts become, of course, in the mouths of the uneducated, sounds of sufficiently strange import, like the cabalistic *sesarara*, for *certiorari*, of Nicholas in the "Puritan," attributed to Shakspeare, and the well-known "O yes." But occasionally the vernacularism becomes written and established, as in "justices in Eyre," i. e. "justices *in itinere*," itinerant Judges (not, however, to be confounded with "cursitor barons"), and "jeoffail" (pronounced *jeffail*), "an oversight in pleading," for *j'ai failli*. Even the old Saxon *Thryddings*, i. e. Thirdings, denoting tripartite division, have been transformed into *Ridings*.—The "*Four Ridings*" of our Canadian county of York indicate, verbally, something that is impossible. At the first organization of the Province of Upper Canada (1798), the County of Lincoln also was divided into *four* Ridings, and the County of York into *two*. Yorkshire in England, whence the term has been (without intelligence) adopted, retains its original subdivision into *three* sections, or thryddings.

A suspicion of "means of living" has crept into "livery." But "livery" in all its senses, legal as well as ordinary, is the French *livrée*: from the Latin *liber-are*. That which we give and deliver over we separate and set free from ourselves.

Among musical instruments, the oriental *sambuca* is vernacularized into *sackbut*, although *sambuca* is a stringed instrument, and *sackbut* is the *trombone*. Out of *hautbois* we make *hautboy*. It is not long since it was *hoboy*. The Italians have turned it into *oboe*, a term we employ as well. In the time of Edward III. the instrument was

called a *wayghte*. Our Christmas *waits* retain the name, even though the *thing* be no longer used by them. We mould into *shawm*, *chalu-meaux*, from *calamus*, a reed; whence also *calumet*, and *haulm* (Fr. *chavme*), an old word for straw.

Popular sports and pastimes, especially when introduced from abroad, might be expected to yield a crop of vernacularisms. The technical terms of such amusements are almost sure to be taken, either intentionally or by accident, in a local sense. In the case of Cards the plainest-spoken man who calls a *spade* a *spade*, is wrong. *Spade* is *spada*, Spanish for *sword*; and as swords, "spades" appear on Spanish cards. This suit was intended to represent the military class. In "clubs" we have been inconsistent. We have borrowed the Spanish name *basta*, "club or bludgeon," but have stamped upon the card the object adopted by the French in this regard, merely a trefoil or clover-leaf. This the French call the *trèfle*. (What we call the "club" the Danes call *klov-er*: has this influenced the term we use?) This suit is to be taken as standing for the agricultural class.—"Hearts" have arisen from an English misapprehension of the French word *chœur*, i. e. choir.—It was imagined to be *cœur*. They represent the *gens de chœur*, the ecclesiastical order. On French cards the figure on this suit is that of a *chalice*, which we modify into a *heart*, following up our verbal vernacularism by a pictorial one.—"Diamonds," little superficial lozenges or rhombs, now, (in French, "quarries," *carreaux*), are conventional representations of those minute specimens of coloured quartz and other products of crystallization, which men have agreed to estimate so highly; which they find so peculiarly charming to the eye that they designate them, *par excellence*, "delights" (*gaudia*, *gioja*, *joya*, *j'ye*), intensifying their expressions of affection in regard to them by the use of *diminutives*, and calling them *giojelli*, *joyels*, *joyaux*, "jewels."—This suit symbolizes the *merchants*, the great travellers of former days, who brought home from their distant tours rare specimens of the objects referred to. (Our *jew-el* perhaps glances at what was not unfrequently the national descent of the dealers in these fascinating commodities.)—With the Spaniards "diamonds" are *oros*, gold pieces, and "hearts," *copas*, chalices or cups. Other modifications from the Spanish, in Cards, are *ace* for *as*, *trump* for *triumfo*, *pool* for *pollo*, i. e. stake, and *ombre* for *hombre*. i. e. "your man" The Spanish *nappes*, for Cards, in Italian *naipi*, is the Arabic *naib*, i. e. represen-

tative. *Naype* has nevertheless been attributed to the initials N. P. of one Nicolao Pepin, who had something to do with the introduction or early manufacture of cards.

“Chess” is a vocable quite English in its sound. It has been rendered so by the usual process. It comes to us through the French *échecs*; in old French, *eschacs*, *eschas*, *eschies*; in old Spanish, *axedres*; and, modern Spanish, *xadrez*, *xaque*; modified into *scacco*, in Italian; whence the Late-Latin, *scaccus*.—The Spanish, *axedres*, is an attempt to enunciate the Arabic, *al-shatranj*. The name of the game, in the old Persian of the 6th century of our era, was *chatrang*, a term wholly un-Persian, as we shall presently see. This, in the later language, was vernacularized into *schack-tranj*; with an allusion insinuated to the *schack*, or king. The true origin of *shatrang*, however, was the Sanskrit, *chatur-anga*; the *quatuor-membra*; the four arms of a military land-force: elephants, horses, chariots, foot-soldiers. To these, the Persians added an emperor, with his generalissimo. Here, then, are our English chess-men. But, their respective names have descended to us somewhat disguised, in some instances, by vernacularization.

In the Persian game, the first piece is the *schack*; the second, the *pherz*, or, vizier—the prime-minister and generalissimo. Then follow a set, denominated *phil*, the brigade of *elephants*; then another, *aspen-suar*, the cavalry troop; then another, *ruch* (a misunderstanding of the *rat'h*, *rot'h*, “armed chariot,” of the Hindu), auxiliary *dromedaries*; and last, the *beydal*, a body of *infantry*.

The *schack* continues, duly translated “king.” (“Check-mate” = *Schack-mat*, “le roi est mort.”) The *pherz* became, in French, under the influence of popular interpretation, *ferciè*, *fierce*, *fierge*, *vierge*, virgin—this last passing, finally, into *dame*; abbreviated, of course, from *notre-dame*. With us, the *dame* has been converted into *queen*. The *phil*, in Spanish, by incorporating the Arabic article, is *alfil*; which, in Italian, assumes the forms *alfido* and *alfiere*. The French made it *fil*; then *fou*. In old French, it was *aufin*; whence, under the hands of the Latinists of the day, issued the very respectable *alphinus*, the *alphyn* of Caxton’s translation of Jacopo Dacciesole’s *Solatium Ludi Scacchorum*. “The alphyns,” Caxton there says, anno 1474, “ought to be made and formed in manere of juges syttyng in a chayer, with a book open to-fore their eyen.” From this description we can see how in England the

alphyn came to be styled a *bishop*.—As to *fou*, buffoon, the French descendant of *phil*,—the Abbé Romain (as quoted in *London Society* for December, 1865) thus sharply remarks upon it in his Poem on Chess :

Au jeu d'échecs tous les peuples ont mis
 Les animaux communs dans leur pays ;
 L'Arabe y met le léger dromadaire,
 Et l'Indien l'éléphant ; quant à nous,
 Peuple falot, nous y mettons des fous.

The *aspen-suar*, the horseman of the Persians, retains his identity without material alteration. But the original *rot'h*, 'armed chariot,' Persianized, as we have seen, into *ruch*, a dromedary, has suffered vernacularization again ; first in Italian, where it became *rocca*, 'rock' in the sense of 'fortress on a rock ;' and secondly, rather barbarously, with ourselves, among whom it goes by the name of *rook*.—Finally, the *beydal*, or footsoldier, has reverted, at all events in sound, to a word familiar in the primitive home of Chess, namely, *peon*. In French it is *pieton* and *pion* (in old French *péon*, i. e., the Latin *pedo* as synonymous with *pedes*, footsoldier) ; and with us, after manipulation in the approved English manner,—*pawn*.

ON SOME MINERALS FROM LAKE SUPERIOR.

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A recent visit to the north-west shore of Lake Superior enabled me to obtain several minerals of much interest, including two or three species previously unrecognized in Canada. Brief descriptions of these latter, with a few observations on some of the other minerals which occur in this region, are offered in the following notes :—

1. *Native Lead*. As a natural product, lead is well-known to be of exceedingly rare occurrence in the simple or metallic state. On this continent—apart from its occurrence in the meteoric iron of Tarapaca, in Chili—it has hitherto been noticed only at one spot, namely : in a galena vein, traversing limestone (of unstated geological age), near Zomelahuacan, in the Province of Vera Cruz, in Central Mexico. The specimen, from the locality now under consideration, was obtained by MR. MCINTYRE, of Fort William, at a spot near the celebrated Dog Lake of the Kaministiquia. The lead occurs in this specimen—the only

one, I believe, discovered—in the form of a small string in white semi-opaque quartz. The quartz does not appear to contain the slightest speck of galena, nor any other substance, except a small quantity of specular iron ore; and the unaltered appearance of the latter is such as to preclude the supposition of the lead having been derived from galena, or other lead compound, by artificial heat. Before coming to my hands, the specimen had been examined by MR. T. W. HERRICK, whose extensive surveys and explorations in this region are so well-known, and by him it was looked upon as metallic lead.* My experiments fully confirm this determination. The lead, when cut, presents the ordinary colour, softness, and ductility of the pure metal. The sp. gr. cannot be properly taken, on account of the very small quantity at command, the larger portion of the lead having been used up before the specimen came into my possession. Tested by the blow-pipe, however, the substance melts readily, and volatilizes; imparting a blue tint to the flame-border, and forming a yellow ring of oxide on the charcoal. The fused globule is perfectly malleable. On the cupel, it becomes entirely oxidized and absorbed, without leaving a trace of silver. The cupel-stain, when cold, is of a clear yellow colour, shewing the absence of copper, nickel, &c. The nitric acid solution yields with reagents the ordinary reactions of lead-oxide. The substance is distinguished from galena by its ductility, and by yielding no sulphur-reaction with carb-soda before the blowpipe. From Bismuth, also, it is distinguished by its perfect malleability, as well as by the blue colour which it imparts to the outer border of the blowpipe flame. As a further test, it may be stated that a small cutting placed in a solution of bismuth in nitric acid, produces a black arborescent precipitate of that metal.

This discovery is interesting, not only from the extreme rarity of *Native Lead*, but from the fact, also, that in the few undoubted European localities in which the metal has been found, the latter is generally accompanied by gold. The quartz in which the Lake Superior specimen occurs, has, curiously enough, the somewhat waxy aspect and other characters, more easily recognised than described, of the gold-bearing quartz of California and other auriferous districts;

* I have been indebted to Mr. Herrick, from time to time, for many interesting specimens of Canadian minerals, obtained during his arduous explorations on the north shores of Lake Huron and Lake Superior; and, I take this opportunity to bear testimony to his good knowledge of minerals generally.

and the geological position of the rock, immediately above that of the Huronian strata, is in a measure identical with the horizon of the gold-bearing rocks from which the auriferous deposits of Eastern Canada have been derived. No gold has hitherto been met with, however, in the sands of the Kaministiquia or other streams of Thunder Bay.

2. *Galena*, PbS .—This well-known mineral, the common ore of lead, occurs at numerous localities on the north shore of Lake Superior. Some especially rich lodes lie in the township of Neebing, on Thunder Bay, and others of even greater promise have been discovered in the district around Black Bay. In most localities of this region, the galena is accompanied by copper pyrites, the latter occasionally predominating. The veinstone is principally quartz, with calc spar, heavy spar, and fluor-spar in subordinate quantities. When crystallized, the galena presents almost invariably the common combination of cube and octahedron. This combination and the simple cube are the only crystals that have come under my observation in these lodes. I have assayed a good many samples for silver, without finding any workable quantity of the latter metal. The highest amount that I have obtained, corresponds, indeed, to no more than $1\frac{1}{2}$ oz. to the ton of reduced lead. This comparative absence of silver appears to be connected with the very general absence of arsenical minerals throughout the district. I am not aware that attention has hitherto been directed to this point; but a comparative study of the classical lead districts of both Europe and this continent will, I think, be found to warrant the conclusion, that, where arsenical ores—such as arsenical pyrites, Fahl-ores, &c.—are generally absent, the galena will not prove to be argentiferous in a paying point of view.

3. *Marcasite*, FeS^2 .—The occurrence, in Canada, of Iron Pyrites in its Trimetric or Rhombic condition, has not been hitherto announced. I obtained several well-characterised examples from the walls of a large vein, holding galena and copper pyrites, in lot 25 of the fifth concession of the township of Neebing, a few miles east of the Kaministiquia river; and a remarkably fine specimen from the same locality was kindly presented to me by Mr. McIntyre, of Fort William. The latter specimen may be seen in the Museum of the Toronto University. In all of these examples, tabular prismatic crystals are united somewhat irregularly, but with the basal plane in common, in curved rows, with an acute angle of the prism projecting outwards, and thus forming the variety known as “Cockscomb Pyrites,”

the "Kammkies" of German authors. In this variety, the crystals are not united regularly by a plane of the prism, or by one of the macrodome planes, as in the true twins of Marcasite, but are simply formed at the free end of the radiating lamellæ, the broad surface of the latter representing the basal plane. A point of much interest, in connexion with these specimens, is the occurrence of common or cubical pyrites *in the same vein*. The latter species occurs in different parts of this vein, in small but distinct crystals—combinations of the cube and octahedron, with the cube faces predominating. Where representatives of the separate conditions of a dimorphous substance thus occur together, the cause by which the dimorphism was produced is not readily explained. In the present instance there were no data to shew that one condition had originated at an earlier or later period than the other, and yet such must in all probability have been the case.

Some of the marcasite specimens from this spot had already entered into decomposition when first obtained—the products being an efflorescence of sulphur in one instance, and, in others, the formation of sulphate. The latter was also in itself altered, by the partial conversion of the FeO into Fe^2O^3 , its solution yielding an abundant blue precipitate with ferrocyanide of potassium ("yellow prussiate.")

4. *Molybdenite*, MoS^2 . Several veins of quartz, in which this mineral is abundantly distributed, occur on the shore of Sea-beach Bay, near Black River (Lat. $48^\circ 46'$ N.; Long. $87^\circ 17'$ W.). Some specimens from one of these veins discovered by Mr. Salter, the surveyor, gave me (by mechanical analysis) very nearly $4\frac{1}{2}$ per cent. of Molybdenite, an amount equivalent to about 100 lbs. per ton. Copper pyrites is also present in the quartz.

5. *Barytine*, BaO , SO^3 .—It has long been known that many veins of Heavy Spar or Barytine occur on the north shore of Lake Superior, several of these veins being almost free from colouring matter, and hence of good quality as a paint material; but I am not aware that any crystals from this region have hitherto been described. From the vein in Neebing township (about ten or twelve miles from Fort William,) in which the cockscomb variety of marcasite (described in Note 3) was obtained, I procured a great number of small crystals of this mineral, of a pale yellowish or reddish colour. The same forms were present in all, producing a combination of: 1, the base, $\infty \infty$; 2, a front-polar or macrodome, $\frac{1}{2} \infty$; 3, a second or lower front-polar

$\frac{1}{2} \bar{\infty}$; and 4, the side-polar or brachydome $\bar{\infty}$,—the crystals being elongated in a right-and-left direction, *i. e.*, in that of the macrodiagonal or longer horizontal axis. Most of the crystals, apart from this elongation, offer a very symmetrical aspect; but in some, as often happens, certain planes become crowded out, or reduced to mere lines: a plane of the form $\frac{1}{2} \bar{\infty}$ being generally the sufferer in the present case. The angles measured are as follows:— $\bar{\infty} \bar{\infty}$ (base): $\frac{1}{2} \bar{\infty} \bar{\infty} = 158^\circ$; $\bar{\infty} \bar{\infty}$: $\frac{1}{2} \bar{\infty} \bar{\infty} = 141^\circ 4'$; $\bar{\infty} \bar{\infty}$: $\bar{\infty} \bar{\infty} = 127^\circ 15'$. Axes: a (vertical axis) = 1.315; $\bar{a} = 1$; $\bar{a} = 0.8141$. It should be observed, in reference to the crystallization of Barytine, that some crystallographers make the base, as here given, a side-vertical (or brachy-pinakoid of Naumann) = $\bar{\infty} \bar{\infty}$. In this position, the front-polars, $\frac{1}{2} \bar{\infty}$ and $\frac{1}{2} \bar{\infty}$, become vertical prisms; but the side-polar or brachydome, $\bar{\infty}$, remains unchanged.

6. *Fluor Spar*, CaF.—Examples of this mineral are met with in many of the copper-ore and other veins of Lake Superior; but some unusually fine specimens have been lately obtained from large vugs in a broad vein of amethyst-quartz, situated a few miles inland from the N. E. corner of Thunder Bay. These specimens are crystallized in simple cubes, most of which measure from two to three inches across, and they occur as a bold capping on equally large pyramids of amethyst. The fluor spar is thus the later formation of the two, and it is in itself coated with a still newer formation of drusy pyrites in small cubes. Its colour is partly pale greenish, but mostly violet, like that of the chief mass of the quartz on which it lies. These fine crystals may be obtained in blocks of the dimensions of several cubic feet, forming magnificent museum-specimens. For those in my possession, I am indebted to the kindness of Mr. Herrick, by whom the vein has been somewhat extensively opened out. For several fine crystals of amethyst from this locality, I have also to thank Mr. McIntyre, of Fort William. Many of these amethyst crystals exhibit externally, or along their edges, a deep brownish-red colour, from the presence of innumerable spots of sesqui-oxide of iron deposited within or just beneath the surface-layer.

7. *Anthracite*.—In the Revised Report (1863) issued by the Geological Survey of Canada, a small amount of anthracitic matter is said to occur in cracks in the chert beds of the Lower Copper-bearing Rocks of Lake Superior, as seen in the vicinity of Thunder Bay. A small vein of this kind was discovered by Mr. Herrick, on the north

shore of the bay, about two years ago. The vein in question averages about five or six inches in width, and is nearly vertical. A thin layer of colourless quartz lines the walls on each side. This is followed by about half-an-inch or rather more of Iron Pyrites, possessing a radiated structure, but crystallizing on its inner surface in combinations of the cube and octahedron. To this succeeds another band of white, crystallized quartz; and the middle of the vein is filled with black and highly lustrous anthracite. The vein thus offers, though of small size, a fine example of banded or riband structure, shewing, in passing from one wall to the other: 1, quartz; 2, iron pyrites; 3, quartz; 4, anthracite; 5, quartz; 6, iron pyrites; and 7, quartz. Here and there, a thin coating of anthracitic matter occurs also on the surface of the pyrites, or runs through the latter, dividing it into two or more layers. So far as my observations go, all the large mineral veins of this district exhibit, on the other hand, a brecciated structure, with very subordinate or irregular indications of banding.

The anthracite from this vein possesses the following characters:— Colour, jet-black, with high lustre; streak, greyish-black. Very brittle. Fracture, more or less conchoidal. $H=2.25-2.5$. Sp. gr. (as determined by a light sp. gr. bottle)=1.43. Before the blowpipe it cracks slightly and loses its surface lustre, but exhibits no further change. Heated in a small flask or bulb-tube, it gives off a little moisture, but without any accompanying trace of bituminous matter. In powder, in a thin platinum capsule, it burns completely away, but a long-continued ignition over a Bunsen's burner or double-current lamp is necessary to effect this. Carefully picked fragments do not leave a trace of ash: a peculiarity which must not be lost sight of, in attempted explanations of the origin of anthracitic matter in this apparently abnormal position.

Two assays gave the following results:

Moisture.....	2.08...	2.23
Additional loss by ignition in closed vessel...	3.56...	3.62
Ash.....	0.00...	0.00
Fixed carbon, by difference.....	94.36...	94.15

REVIEWS.

Our Convicts. By Mary Carpenter. 2 Vols. Longman & Co., London; Dawson & Co., Montreal.

Very slowly and gradually have even the wisest men learned to recognise law in the results of human feelings and actions, as well as in the mutual influences of external things, and have thus laid the foundations of a science having for its object the social relations of human beings, and the means by which they may be so regulated as to confer the greatest possible amount of diffused happiness. Much more slowly still the masses of mankind are learning to put some confidence in the truths of this science, and to attempt their application in the management of affairs, instead of regarding them as unsubstantial theories with which ingenious men amuse themselves, but which have no concern with the actual business of life. Political principles have been regarded as party prejudices, traditional sentiments, or professions made with a view to personal aggrandisement. Questions affecting the wealth, progress and prosperity of whole communities, have been decided in conformity with the confined views and selfish interests of individuals, without a thought of there being better means of judging than their limited experience and petty aims. The rude methods of barbarous times have been continued in the treatment of those who violate established laws, or have only been relaxed into an inefficiency of control or an encouragement of wrong-doing which is most alarming to contemplate. Gradually, however, the signs appear of a better state of things: already we have a political science, and an economical science, resting on solid foundations, clear as to what they undertake to accomplish, and leading towards practical conclusions which all intelligent men will be obliged to accept—and if other special branches of social science can scarcely be said to have advanced so far, it may be found, that, having less powerful interests and prejudices to contend with, when once brought into notice, their progress will be more rapid. Nothing can be more important than the branch of social science to which Miss Carpenter's book invites our attention. The pestilence of crime is worse than plague, yellow fever, or cholera. Like them, its existence depends on definite causes which may be understood, and to a considerable extent counteracted. As with them, our hope of checking its ravages, and of treating with suc-

cess individual cases, must depend on our exact acquaintance with the real nature and origin of the disease, and with all the influences from without and from within which promote or may be used to restrain it. Whilst terror was regarded as the only efficient preventive of crime, and to maintain it in the public mind, whilst getting rid of dangerous characters, torture and death were freely employed, the management of our criminal population was simple and intelligible, but most revolting to humanity. These times have passed away, and if it cannot be said that better means have yet been brought into action for checking crime, at least an end has been put to wholesale slaughter and disgusting cruelty perpetrated under the sanction of law. If our prisons are far from yet being, what they ought to be, schools for reformation, they are at least no longer the foul sinks of filth, disease and misery which once they were. We might be tempted to congratulate ourselves on this degree of progress if we could be sure that we are still advancing in the right direction, but the whole subject seems to be attended with such difficulties, the confusion in the popular mind so great, and the evils resulting from a total failure thus far in the attempt, on a large scale, to repress crime, and the degree in which it is even multiplied by the methods employed against it, are so alarming, that instead of finding any cause for satisfaction in our actual condition, it ought to be to us a source of constant anxiety, and a demand for perpetual efforts for the attainment of a better system. It cannot be but that a better system is possible. The simple fact is, that at present, imprisonment only fosters criminal dispositions and returns men on society more determined and better prepared to prey upon it; transportation is prohibited by the impossibility of finding a suitable field for it, as well as on account of other grave objections in respect to its expense and its deficiency in most of the qualities of a useful punishment, and branding, public flogging and other attempts to affix permanent disgrace to criminality, are known only to create a desperate class, and are utterly opposed to the humane feelings of the age in which we live. What then is to be done that crime may not eat into the very vitals of Society, and ere long utterly destroy our boasted civilisation? What most readily occurs to most people is that we should increase the severity of our punishments in order to make them more effectual in the way of warning. This implies that men can be terrified from the commission of crime, and that terror is the most certain mode of influencing them in our power. We hold,

on the contrary, as was long ago clearly proved by Mr. Roscoe in his admirable papers on the subject, that excess of punishment above what is appropriate to the offence, and tends in other ways to good purposes, never has the effect of deterring from crime ; that men in general, constantly led to regard determination and bravery as noble qualities, and readily hoping that they shall in some way personally escape the threatened danger, and especially the criminal class which is trained to daring, cannot be frightened from their course, whilst extreme severity always enlists public sentiment in favour of the sufferers, so that those additions to punishment which are especially intended to make it exemplary, always fail in their intended effect, and are productive of more evil than good. This being so, as we firmly believe that both reason and experience will prove, we have no resources left to us but in judicious efforts to limit the causes of crime, and in a determination to make the punishment which is in our power, imprisonment, effectual both in creating a strong desire to avoid it, and in improving, and in a large proportion of cases, restoring the character of those subjected to it. If we judged of what may be done from what is done we should indeed be driven to despair, but besides what is suggested by an acquaintance with our common nature, which, if it exhibits much frailty and imperfection, also plainly shows capacity for good and susceptibility to the influence of motives, there are happily experiences, though as yet comparatively few and limited in their influence, which establish to an absolute certainty, the possibility of making punishment a great power in society for checking crime and reforming those who have been guilty of it. That we may see how this can be done we must begin by ascertaining the actual facts respecting the condition of our criminal population, and the influences to which they are ordinarily exposed, and we must then examine what reason and experience suggest respecting better methods than have as yet been generally adopted. Plain, well-authenticated statements of fact are of all things most effectual for rousing indifference, overcoming prejudice, and stimulating to exertion in contending with tremendous evils. All who desire the most valuable information on this great subject are deeply indebted to Miss Carpenter for the work now before us. It may possibly occur to many that it cannot be to a lady that we must look for useful information on such questions as relate to crime, criminals and the means of practically dealing with them. To such we can only say, try and judge for yourselves before you

reject valuable assistance because it comes from an unexpected quarter. You will find the lady appealing to the best sources of knowledge, not unaided by some of the highest authorities of the age on such questions. You will find her uniformly employing a judgment trained by the best education and matured by practical experience in connexion with juvenile reformatories, to which she has benevolently devoted so much of her attention. You will find her uniting the delicacy which belongs to her sex and culture with a dignified superiority to mere conventionalism, and an earnestness of philanthropic zeal, which make her fully equal to what she has undertaken; and it is our belief that there is scarce a man to be found, however able, enlightened and benevolent, who could have accomplished the work as well as she has done. It might possibly occur to some that in a new country like Canada we can have little to do with the difficulties attending the treatment of criminals, and that we may safely watch the experience of other countries without any extreme anxiety as to the adoption of immediate measures different from what have hitherto been deemed sufficient. Such persons show as much ignorance of what is passing around them as neglect of such wise cautions as *obsta principiis*: Make your arrangements before-hand to meet difficulties and dangers which must arise, and which will be the more formidable in proportion as they are allowed time to come to a head before they are provided against. Unfortunately it is too certain that in proportion to the numbers and degree of crowding of our population, we have more crime than older countries, and are already suffering severely from the insufficiency of our means of contending against it. Nor is this greatly to be wondered at when we consider that, among persons induced to emigrate, there is a larger proportion than in an equal number of settled people remaining at home, of the less steady and respectable class; that religious and harmonizing influences are with much difficulty brought to bear on a very scattered population, and that adjoining by a long frontier a great nation with the same language and general manners, we are of necessity subject to receiving from them many of their worst characters, who find it convenient to change their residence, whilst, from our smaller body, they cannot draw off anything like an equal number. We must not, then, flatter ourselves that inquiries respecting the origin of, and the means of suppressing crime, do not immediately concern us. On the contrary, we ought to feel most deeply interested in them, and most anxious to

learn what can be done to save our country from evils already severely felt, and in prospect overshadowing our future with a dark cloud. With these preliminary observations, we shall lay before our readers such a slight abstract of Miss Carpenter's work, with illustrative extracts, as the space at our disposal will permit, earnestly recommending them to study it in its details, and that not from mere curiosity, but with a view of practically understanding a subject in relation to which they may hope to serve their country and their fellow-creatures. We must begin with a few paragraphs from the commencement of the book :

“Our Convicts ! They are a part of our society ! They belong to ourselves ! They are not only subjects with us of the same great British empire on which the sun never sets, but they belong to the same British Isles, the same small centre of civilization, the same heart of the world's life, the same Island, small in geographical extent, infinitely great in its influence on the nations,—whence must go forth laws, principles, examples, which will guide for better or for worse the whole world !

“Fain would we say that these convicts are not *ours*; that they have cut themselves off from us ; that they have excommunicated themselves from civilized society by their own acts ; that they no longer belong to us. The very name of “Convicts” excites in the mind an idea of moral corruption which would make one shrink from such beings with a natural repulsion, which would lead one to wish only that like the lepers of old they should dwell apart in caves and desert places, warning off the incautious passenger with the cry “unclean, unclean.” We might desire to rid ourselves of them by sending them off to some remote region, where Nature herself should guard them with her impregnable walls of ice, scantily yielding them bare subsistence from a barren, grudging soil ;—or to some spot where they should be cut off from the civilized world by the mighty ocean.—and where their fiend-like passions should be vented upon each other, not on peaceable and harmless members of society. Many would fain thus separate themselves from Convicts ; would gladly thus rid themselves of the awful responsibility which lies in the words—“*Our Convicts.*”

“*But they cannot !* These Convicts are men, are women, who were born among us, reared to manhood and to womanhood among us. We have mingled with them in the ordinary walks of life, we may even have eaten at the same board with them, and until the law put its fatal mark upon them, so that they were henceforth to be known as Convicts, we did not see anything in their outward appearance, whereby, in their various grades of society, we should have distinguished them from other men and women. But now this very legal sentence which makes us wish to separate them entirely from ourselves, only binds them closer to us. They were *free agents* while they were pursuing their mischievous calling, while they were transgressing the laws of God and of man, and we did not separate ourselves from them ; had they been then branded by the indignation of society in England, they might have gone to other parts of the empire, and

there retrieved their character or plunged into fresh crimes. We should not then have been responsible for them. But now all is changed. The sentence of the law has placed them in our keeping for many years. We cannot, now they are *legally proved* guilty of crimes against society, drive them from our country, or banish them from our shores, content that they shall still be responsible for their crimes to the Judge of all, before a higher tribunal. We have deprived them of the right to guide their own actions since that right has been abused; we subjugate their will, we confine them in our own country, and put them under such treatment as we consider best for them and for society. We therefore have doubly bound them to us, and ourselves to them. They are *ours*, and we *cannot*, if we would, shake off the responsibility arising from this relationship, however painful it is. It behoves us then to consider the 'Treatment' which 'Our Convicts' should receive."

Next we will give our author's preliminary sketch of her plan:

"We shall first consider who Convicts are.

"The fact of their being classed together under the same brand of the law, by no means makes them of one nature or of the same degree of guilt. The commission of the same legal crime by no means indicates the same moral depravity. Burglary may involve daring robbery and murder, and may be perpetrated by one long experienced in all the arts of housebreaking, who wanders from county to county like a wild beast seeking his prey, or one who would be a brigand or a bandit in a country under less control than our own;—while, perchance, an offence legally designated by the same term is committed by a little girl of ten years old, whose sole fault was, that having lost her Mother, and being necessarily without proper care from her Father, who was compelled to earn his daily bread, she had made her way into a neighbour's house to supply her wants. Robbery from the person may be perpetrated by a daring and experienced Convict, ready to add violence or even murder to his theft; or by a small child of nine years old, who is trying the lessons which have been given to her diminutive fingers by a wicked parent. We cannot classify Convicts by their nominal crimes; we shall endeavour to form some correct idea of them by other means.

"It will be important, in the next place, to form some idea of how persons arrive at the degree of hardened vice which our investigation will disclose. We must try to learn the cause of the disease as a guide in our treatment of it, and as a means of checking its progress.

"The principles which have been laid down by experienced persons, and which have been proved to be true by actual success, will next be considered; facts will be adduced in demonstration of them.

"After this preparation, we shall endeavour to form some clear idea of the system of Convict discipline actually in existence in our country, with its results. In doing this, it must be clearly understood that no means of information are open to the writer but such as are perfectly accessible to every one who chooses to investigate the subject. The Prison Matron revealed secrets of the prison-house of which none but a resident in that abode of horrors could have been possessed. Persons officially connected with the Government Gaols have sources of information which none but those so circumstanced can obtain. They who enjoy personal

intercourse with our rulers, may understand many things which are mysteries to those without the privileged circle. Access to the establishments obtained through persons in office, may reveal at a glance to an experienced eye what may be a lasting perplexity to the less privileged. But the writer of this work has enjoyed none of these advantages. Happily, however, there are open to all, sources of knowledge even more satisfactory, in the evidence which was laid before the Royal Commission last year, and from this, and from the witnesses before various Parliamentary Committees, we shall be able to obtain reliable information.

"Of the *results* of the system adopted in Great Britain, we must form a judgment from less official sources, for unhappily in our country there has never yet been adopted such a system of identification and registration of criminals and their acts, as would give even the possibility of an approximation to truth from any criminal statistics that exist. We find even that in many cases the persons who may be supposed most cognizant of actual facts, and most in a position to obtain reliable statistics, arrive at conclusions most at variance with the reality which is patent to the public, and that they are most vague and theoretical in their statements. We must, therefore, be satisfied with such amount of knowledge of results as we can obtain from ordinary facts and general opinions founded with reason upon them.

"Having thus endeavoured, from such means of information as we possess, to obtain some distinct view of the Convict system in Great Britain, and the results of it, we shall study the working of a system founded on different principles in the Sister Island; and here, an accurate identification and systematic registration of criminals throughout the country, will enable us to arrive at definite results, which may be considered reliable, as they are thoroughly supported by the independent testimony of public opinion. The writer has here had the advantage of both personal and official information respecting the working and the results of the Irish Convict System, which will be presented to the reader.

"Whether removal to another country can take part in our Penal System will then be considered, and the evidence on the subject will be analysed, which was last year brought before the Royal Commission. Improvements in our present system will also be suggested, as they have been brought forward by many experienced persons.

"In conclusion, we must remember that the Convicts are still *ours*, even after their punishment, and must return to our midst when they have been discharged from the Convict Prison. Society has a right to expect that during the period of a costly incarceration the best possible means shall be adopted by the Government for the reformation of those entrusted to them, for their preparation for reabsorption into the community; but, on the other hand, the Government must be supported in its efforts by society, and especially by that portion of it which is professedly Christian. What has been done to promote this great object, and what may further be done, will be briefly shown."

We thus have before us the plan and object of a work which, in two *Svo* volumes, embracing 673 pages, treats in an orderly, practical, and at the same time scientific manner, one of the most important subjects

that can engage the minds of the thoughtful and benevolent. It would be impossible for us here even to touch upon each distinct branch, or to attempt maintaining the connection of the reasoning. If in hastily running through it again for this purpose we can succeed in bringing forward a few passages of independent interest, which may lead attention to the book itself, our object will be fully answered.

At p. 24 is a curious estimate, apparently not exaggerated, of the loss to society by 16 thieves, whose names, ages and length of criminal career are given, amounting to no less than £26,500. This must, at least, serve to give one striking, though in reality the least important, view of the interest attaching to the subject.

At the beginning of the second chapter, entitled "How are our Convicts made?" after referring to the specimens, if we may so speak, of criminals given in the preceding pages, the author proceeds:

"But these persons have not suddenly become so lost to all good, so completely the slaves of sin. We should try to gain some insight into the nature of the temptations and circumstances which have plunged them to such a depth of wretchedness. Before attempting to cure we must learn the nature of the disease, and we must endeavour to ascertain whether there are not evils for the existence of which society is directly responsible, which must, unless removed, forever perpetuate in our midst the mass of corruption from which we are suffering.

"How do men and women arrive at a condition of so much depravity?"

"How far is society, directly or indirectly, to blame in the matter?"

"These are questions which we shall endeavour to answer in the present chapter.

"Here is a history of a criminal career given by an old offender himself to the Chaplain of the Gaol, Rev. W. OSBORN, of Bath:—'I have been told a thousand times to go and get work, but it was never said to me during twenty years, while in or out of prison, 'I'll give you work.' Hence I have cost the country some two thousand pounds, and I expect to cost a great deal more yet. *I was sent to gaol for two months when a boy for stealing a loaf of bread, and no one cared for me.* I walked to the seaports, but in vain. I tramped, sore footed, thousands of miles when I was a lad, in order to get honest employment, but it did not answer. I was tempted to steal. I stole. I was imprisoned. I was sent to Bermuda. I have learnt the trade of a professional thief, and now I intend to follow it. I believe all philanthropy to be a mockery, and religion to be a delusion, and I care neither for God nor man. The gaol, penal servitude, and the gallows, are all alike to me.'

"This is, probably the history of thousands; and who is to be blamed? Are there no accessories to the life this man is leading? How was the boy who would 'tramp sore footed thousands of miles to get honest employment' transformed into a man who disbelieved humanity,—who scoffed at religion, and consequently defied the laws of God and man?"

And after adding two other instances, she says :

“Now these three cases are probably representative ones of a large class of our Convicts, and they give us some idea of the way in which they became cut off from society. No individual person appears directly to blame for the condition of any one. And yet we can hardly hold any one of them morally responsible for his position in our Convict Prisons. What would any of the children of the upper classes become if so tossed about in the world? Is our society rightly constituted, or truly Christian, if young, inexperienced persons, without proper parental guidance, are to be so left to the hard usage of the world?”

The following may be taken to be principal sources of criminal conduct in the young, and means of training them to increased skill and recklessness in their evil courses: Gross ignorance and neglect in childhood, from the poverty and wretchedness of parents; direct incitements and encouragements to crime by wicked parents; schools for crime kept by persons who profit by instructing children in the various arts of thieving; repeated short commitments to prison for the earlier offences, hardening and corrupting the character, and completing the education in all the forms of criminality; corrupt and impure literature; such places of amusement as low penny theatres, singing and dancing rooms, &c., and ready access to intoxicating liquors. Striking examples are given of the effects produced by these various influences, which cannot but deeply affect the heart of the patriot and the Christian, and arouse him to greater exertion in stopping the sources of evil and checking criminality in its bud, instead of letting it grow and strengthen until it is a fit subject for the severest punishment.

The third chapter, “On the Principles of Convict Treatment,” one of the most valuable in the book, is chiefly employed in establishing the principle that reformation must be a leading object in all punishment. We quote from its commencement a passage of great force :

“Whatever may be the cause of their present condition, and however much or little they may morally be themselves to blame for it, the habitual offenders who constitute the largest proportion of the inmates of Convict prisons are in a state of absolute antagonism to society and disregard of ordinances, human and divine. They are usually hardened in vice, and they concern themselves with the law only to endeavour to evade it. They dislike labour of all kinds, and to supply their own wants exert themselves only by preying on the property of others. They are self-indulgent,—low in their desires,—ignorant of all knowledge that would profit them,—skilful only in accomplishing their own wicked purposes.

“But they are still men and women, possessed of an immortal nature; still they are the children of the same Heavenly Father; still they are our fellow-citizens.

"We have traced the course by which Convicts have arrived at their present very degraded and dangerous state. Though in some cases a succession of unfortunate circumstances, over which society had no direct control, may have carried on the unhappy victim from one step to another, in each plunging him deeper and deeper in an abyss of crime, from which he was unable to extricate himself, and for which society could not be held *directly* responsible,—yet even in these cases we must have perceived that the prevalence of a more Christian spirit in society, of a stronger moral repugnance to evil, of a greater readiness to help the weak, may have arrested the criminal in an earlier stage of his career. But, in the great bulk of the instances adduced, young persons have become gradually hardened in guilt through causes over which they had no control, and for which society is *directly* responsible. The practice still continues of sending children to prison, though for so long a time it has been declared by the highest authorities worse than useless, and though the existence of schools authorised by the Government renders this incarceration unnecessary. The Workhouses do not yet provide a true home for destitute children, who find themselves better cared for in the hands of justice than in the keeping of those misnamed their guardians. Dens of infamy are still tolerated in our cities, to give to our young children that schooling to vice, which no one gives them to lead them in the right way. The uncertainty of punishment, the glaring defects still existing in our criminal law, allure by impunity or slight punishment to repetition of crime. Society is responsible for all this, and therefore is bound to remedy as far as possible the evils arising from these various abuses. It is, then, our solemn duty, both as members of society and as professing Christians, to endeavour to bring these people to a sense of their responsibility to God and to man, and of their own immortal destiny,—to reform them.

"To induce any permanent change in natures so perverted and hardened, it is evident that no merely external means can be of the slightest value. While under compulsory detention they may be bribed or terrified into some degrees of quietude and submission, but their *natures* are not touched by these means. They return from the monotony and forced propriety of their prison life, only with fresh zest for the exciting career from which they have been for a season snatched. Their long abstinence from intoxicating stimulants is compensated by increased excess. The hated forced labour of their servitude is at once abandoned for the wonted indolence of their old life. All who are acquainted with the histories of criminals are well aware that this is the ordinary result of the present treatment of Convicts, and hence arises a profound and general disbelief in the possibility of reformation among those whose duties lead them to a knowledge of the 'dangerous class.'

"A different principle of management produces different results, and does effect real reformation, provided all external means are adopted in developing the principle which experience and sound judgment suggest."

The argument in this chapter is strengthened by high authority, and by an account of the success attending the plans of Colonel Montesinos, at the prison of Valencia, in Spain; of Herr Von Obermaier,

in the prison of Munich ; and Captain Machonochie, in the penal settlement of Norfolk Island. There can be no doubt whatever that in these cases convicts of the worst character were governed by moral influences, and a real reformation was produced in many instances. The effect may be attributed to the peculiar character of the men, and it may be thought impossible to find officers for public gaols who could carry out such systems ; but, Miss Carpenter argues forcibly to prove that the influence depended on principles which may be sanctioned by public authority ; and, in that case, may be usefully applied by ordinary officers carefully selected. A very interesting portion of this chapter consists of a long extract from an admirable paper, read at the general meeting of the Law Amendment Society, January 12th, 1863, and by them ordered to be printed ; the author of which, Matthew Davenport Hill, Esq., Recorder of Birmingham, is one of the most intelligent, enlightened, and persevering advocates of the improvement of prison-discipline. We wish we could copy the whole passage—the opinion of an eminent lawyer—and, as recorder successively of several great cities, an experienced judge, being likely to have more weight, with many readers, than any amount of argument even from persons of great practical experience, as well as intellectual power, who have not the same connection with the administration of Law.

Our author's next chapter relates to the English Convict System ; that is, to the system pursued in those gaols which are intended for the reception of persons undergoing a sentence of penal servitude, according to the plan followed since the unavoidable discontinuance of transportation, by the refusal of nearly all the colonies to receive convicts. Now this system is professedly reformatory, and as it has certainly failed to produce the real reformation of any considerable number of the convicts ; and has, on the contrary, been attended by much evil, the conclusion naturally to be drawn is that the attempt to make prison-discipline reformatory has failed, and this opinion has actually been adopted by many. Miss Carpenter feels herself, therefore, called upon to show—and she has shown most clearly—that the system adopted in these gaols was not what is approved by the advocates of the reformatory plan of punishment—was not that, or at all resembling that, which has been so successfully applied in the reformatory schools for juvenile offenders ; and was not such as to give any reasonable hope of a successful issue. The evidence on this sub-

ject is so complete that the cause for wonder is not the failure of the system; but, that any other result should ever have been expected.

Under the best conceivable system, the re-absorption into society of those who have undergone penal-discipline is attended with serious difficulty. Under a system so faulty as the present English one has been shown to be, only the worst results could be anticipated; and, the chapter on that subject accordingly establishes the danger and mischief of the Ticket-of-leave System.

The chapter on transportation seems chiefly intended to show how to the extent that it is still possible, in Western Australia, by good regulations in the colony, a proper selection of subjects, and the use of good influences during the long voyage, some good use may yet be made of a punishment no longer possible or desirable in its old form. A large portion of the second volume is devoted to the Irish Convict System, founded on the same Act of the British Parliament, in 1853, which originated the English System; but, with so different a result, that whilst the one, from certain unfortunate mistakes, must be regarded as a lamentable failure, the other is a cheering proof of the practicability of reformatory-discipline, and of the adaptation to human nature of those wise and humane principles which had recommended themselves in theory, but which the many were afraid to apply in practice. Let the nations of the world profit by the example of Ireland, and let the name of the originator of its penal-system be enrolled among the benefactors of mankind. As, directing attention to all that is contained between them, we shall quote the opening and concluding passages of Miss Carpenter's three chapters on the Irish Convict System.

"The English and the Irish Convict Systems were both founded on the Act of Parliament of 1853. The object of that Act was to make such changes in the system adopted towards Convicts, as would prepare them for discharge in our own country, since our Colonial provinces were virtually closed against them, Western Australia only consenting still to receive a small number annually. We have seen that in England the system has hitherto been a failure, but have traced that failure, not to the principles on which that and the subsequent one of 1857 were founded, but to certain omissions and additions which were incompatible with the successful working of the principles. We now proceed to the examination of the Irish Convict System, which has fully developed the principles of both those Acts. The results of the ten years during which it has been in operation demonstrate, beyond any possibility of doubt to an impartial observer, not only the truth of the principles embodied in the Acts of Parliament, but also of those moral principles which are so embodied in it as to constitute its peculiar features,

and of the excellence of the machinery by which these are brought into action. The wonderful combination of all these by the founder of the system, Sir WALTER CROFTON, demands from us very close investigation of its principles, and examination of its details."

* * * * *

"The foregoing simple narrative of the actual progress of the work will, we trust, give a feeling of absolute reality to those who, after reading the various accounts of the Intermediate Prisons, which have, from time to time, come before the public, may have been disposed to believe them an illusion, a pleasing fiction. something too wonderful to be entitled to belief. It could not be imagined that the solution of one of our chief social difficulties had been effected in that Island which, in other respects has been so great a source of anxiety to our rulers. Yet it is actually the case. Eminent continental jurists who had arrived at philosophical conclusions based on deep principles of government, and on the laws of human nature, found to their surprise and pleasure that these principles had actually been developed in Ireland, and acted on for a sufficient number of years to prove their soundness. It is not probable that the Directors of the Irish Prisons had any philosophical system before them when they began their work. They came to it with a full appreciation of what had been already done in England. They had the same Act, that of 1853, as the basis of their operations, and they determined to work out the principles of that Act to the utmost of their power. They found peculiar and unexpected difficulties in their way, which they had to surmount. The disposal of the Convicts by transportation was suddenly cut off from them, and henceforth they must discharge their prisoners at home. An especial aversion existed in the Irish mind to come in contact with those who had endured a penal sentence. The unfortunate men themselves were in a very low state of degradation, physical, intellectual and moral; hence they were not in a condition to enter the labour market, even if it had been ready to receive them. The Government Prisons were in a most unsatisfactory state, both as regarded arrangement, accomodation, and even sanitary condition. The officers also were very ill adapted to their work, and it was necessary to train almost a new staff of subordinates. This was not so easy a matter; for though it has been asserted that it was more easy to adapt the new system to Irish than to English prisoners, experience proves that peculiar qualifications are required in controlling the Irish. Many officers many school masters may be very efficient with the English, who would be totally incapable of acting satisfactorily with the Irish of the lower classes. The Irish are excessively sensitive to wrong and injustice, whether real or imaginary; yet they are equally susceptible of kindness and sympathy, and extremely grateful for them, especially when received from persons in a higher rank, and where there can be no possible suspicion of a sinister motive. It is not, however, always easy to meet with officials who possess such moral qualities as will thus obtain their confidence, and secure their willing obedience. The Directors indeed state in the First Report that they apprehend greater difficulties than have existed in England, with regard to the character of the prisoners, especially as a large number of those who were at that time in the prisons were brought into their criminal position by want of work and extreme distress. We have yet to learn that the Saxon is less amenable to reason and to moral influence than the Celt, and if the means adopted

to surmount the difficulties which were adopted with the Irish Convicts were permanently successful, there can be no doubt that they would be so with the Convicts of Great Britain.

“The means employed were not mere outward appliances. When the Irish Convict System is spoken of, mere mechanical arrangements are not intended; these might be adopted elsewhere and fail, if the spirit were not infused into them which animated all concerned in working it in Ireland. There, from the first day of his entrance, the Convict was taught and gradually led to feel, that though he had, through his own misdoing, lost his personal liberty, yet that it was for himself to control his own will and bring it into conformity with law and duty; and though he had apparently lost the power of shaping his own destiny, yet that in reality, he still possessed it, and that his future, whether for good or for evil, would depend absolutely on himself. The Convict, by degrees, felt hopes of himself, and remembered he was a man, a member of society, one who might fill an honourable place in it, because he perceived that those put in authority over him remembered it too, and had hopes of him, and confidence in him. How could those Convicts fail to comprehend that there was a true human sympathy with them, when the Chief Director devoted his time and labour to converse individually with each one of the four thousand thus incarcerated, learn his difficulties, trials and temptations, study his character, and thus be prepared to give him the friendly advice he needed when again in the world? Combined with this sympathy was strict justice; to every one the inevitable consequences of his own actions were sure to follow, whether good or bad. Here was a law established founded on right and equity and truth, and every one was bound to obey it, whether officer or prisoner. There was no favour, no partiality, no bribery, no indulgence for any one, whether high or low. How could the Convicts do otherwise than respect this justice, and feel willing to obey a righteous law, when they knew that any one of them might appeal to the Director if he thought himself aggrieved, and that his case would certainly receive an impartial investigation!

“A perfect freedom from religious differences constitutes another important feature in the Irish Convict System. This is at all times difficult to attain, wherever persons of different religious denominations are working together in the same establishment; it would be particularly so in Ireland, where unhappily, glaring instances of hostility, arising from religious differences, are continually occurring. The true spirit of Christ should display itself in mutual forbearance, and in that respect for the religious opinions of others which we desire for ourselves. Such has been found in the Irish Convict Prisons, where judicious regulations, strict justice, and mutual courtesy have enabled Catholic and Protestant officers to work in their respective spheres, without interference in their duty, and with mutual courtesy. This is evident in the Reports of the officers;—we have personally witnessed it. The effect of such genuine religious toleration cannot be too highly estimated.

“May these be ever the features of the Irish Convict System, and may it continue, as it has done, thus to blend justice with mercy, and to bring back the erring and wandering into the fold of Christian society!”

The excellent chapter on Female Convicts we can but recommend to attention, having no space either for analysis or comment. The chapter on improvements suggests three, as likely to produce a very great change: 1st., Strict registration of criminals, aided by photography; 2nd., Greater certainty and uniformity of judicial sentences; and, 3rd., Cumulative sentences. The last is of peculiar importance. It was the opinion of Mr. Roscoe, that to make discipline effectual, there must be a power of retaining convicts in confinement until they give reasonable proofs of reformation. So Captain Maconochie, in his evidence before Lord Caernarvon's committee, says, as quoted by our author:—

“If he did not become good with one such punishment, he would become better with a second, and better still with a third, and progressively he would be an altered man, I am confident. He would either be an altered man, or (which is another point that I wish very much to impress upon the Committee) *he would be shut up, through his own fault, for life; because in the administration of punishment I would show extreme severity to frequent reconvictions.*”

And Mr. Recorder Hill gives strong and decisive testimony to the same principle. The next chapter is on prevention. Since habits of drunkenness and debauchery, a corrupt literature, a neglected and ill-trained childhood, and even special schools for instruction in: re, are principal causes of criminality, we know well against what evils we have to guard, in order to prevent the extension of crime. There is not one of these causes which may not, to a considerable degree, be restrained or counteracted. Much may be done by good legislation, and even more by the voluntary efforts of the better part of society. One of the most important agencies is that of Reformatory Institutions for juvenile offenders, under the authority of Government. The success which has already attended these institutions is great and encouraging. Then we have the improvement of the condition of pauper children, and the general extension of education among the people. This last has for many years been an object of intense desire to enlightened patriots and philanthropists, who well know that without universal and even compulsory education, no great improvement in the condition of the neglected classes can be accomplished; but, all efforts in this direction have hitherto been thwarted by the sectarian feelings of rival churches. Canada is, happily, thus far exempted from this great difficulty, though there are many of our people who are recklessly endeavouring to bring it upon us; but, in *offering* education to all, we have done but half our work, well-knowing how many,

from various motives, will refuse to avail themselves of it ; and, if we are to enjoy the benefit of general education, as a preventive of crime, we must compel those to come to our schools whom the indifference, poverty, or wickedness of their parents would keep away.

In England, what are called Ragged Schools aim to provide, in some degree, good influences and useful instruction for the most neglected class. They have been found, in various places, to be attended with the greatest advantage to the scholars and the community at large ; but, to extend them sufficiently, and place them on a solid basis, they absolutely need government aid, which hitherto been sought in vain, and the claim for which is energetically and powerfully urged by our author. The concluding chapter of the work is on "the co-operation of society ;" a short extract will show its spirit :—

"It has been a painful task, probably, both to reader and to writer, to follow our Convicts in their lawless career, living in defiance of God and of man ; to see them dogged and defiant in incarceration ; to behold them, when in partial liberty, only more daring, more hostile to society, gathering strength for new outrages ; to find them again in the world, schooled to new modes of wickedness, corrupting all within their sphere, preying on the peaceful part of society, and, as it were, licensed marauders, until they should, by some extraordinary deed of wickedness again put themselves within the grasp of the law. It was necessary to know the evil, in order to seek for a cure ;—to learn the causes of it, that we may discover means of preventing its constant recurrence.

"We have not, however, been exclusively occupied with scenes of vice. We have had the happiness of contemplating order, diligence, a spirit of brotherly kindness and Christian obedience, succeeding a life of reckless lawlessness,—and this in a Convict Prison. We have seen the men who formerly were ruffians of various descriptions, skilful house-breakers, men who preferred a life of dishonest idleness to one of honest labour,—we have seen these very men, after their time of penal servitude had been completed, go forth in voluntary subjection to the law of the land, engaging in humble laborious work among their fellows, atoning to society for their past misdeeds by their present virtuous lives.

"We trust, then, that faith in human nature, and in the power of the good and the true, has thus been strengthened, not shaken by the foregoing survey, and that many have been incited to put to themselves the question,—*"What shall we, —shall I do?"*" It is the object of this concluding chapter to point out some of the ways in which society may thus cooperate with the Government."

The object of our notice is to induce as many as possible to read the book.

If we consider the experience on the subject, which a life devoted to philanthropic labours has given her, and the diligence, care, and sound judgment displayed in the selection of materials, we shall see

that Miss Carpenter is eminently fitted for what she has undertaken. We have not, here, a book of sentiment, or of speculative reasoning; but cautious deductions from facts, a sufficient number of which are brought under the reader's view, and argument in a truly Christian spirit, showing us how we may hopefully contend against crime, and limit its power—an object dear to the benevolent heart, for the sake of the unhappy criminals, but necessary for the security of society, and preventing an incalculable amount of suffering, loss, and anxiety on one side—of degradation, corruption, and ruin on the other.

W. II.

OBITUARY NOTICE.

Another of our greatest botanists has speedily followed Sir W. J. Hooker. Dr. John Lindley died of apoplexy on the first of the month (November) at his residence, Acton Green, near London. He was generally known as one of the most eminent botanists England has produced, and one of the most laborious and successful writers on the science. He held for many years the important offices of secretary to the Horticultural Society of London, and Professor of Botany at University College, London. He was the founder, and, up to his death, the Horticultural editor of the *Gardener's Chronicle* and *Agricultural Gazetteer*, which has done so much for the improvement of British Horticulture. To him, more than to any other individual, without even excepting Robert Brown, who, with more originality and intellectual power, was deficient in qualities fitting him for a leader of public opinion, is due the high merit of having practically introduced among British botanists the natural method of studying and arranging plants. In accomplishing this object he came into opposition with distinguished and excellent men, whom habit, the prejudices of education, and the influence of circumstances, powerfully retained in the Linnæan school. And here we have to regret both that the views of a man of genius, industry and knowledge, like Lindley, were not listened to with more candour, and, even if they could not be immediately accepted by those accustomed to a different method, resisted with more respectful appreciation of their claims to attention; and, on the other hand, that he should have forgotten at times what was due to the position and real merits of opponents, and indulged in a strain of denunciation against the Linnæan artificial method as if only pernicious to science and against those who still clung to it, which was totally unwarrantable. Sir James E. Smith was a really eminent, as well as a most amiable and excellent man. As a botanist he was distinguished by knowledge of species and genera, and the power of characterizing them precisely and elegantly. He, too, first really popularised botanical science, and to the possessor of the Linnæan collection, who had at once obtained celebrity by that circumstance, a certain amount of prejudice in favour of the Linnæan system might be reasonably excused and treated with respect. At all events, the use of Linnæan descriptive language

at a time when more correct language was scarcely known, might be regarded as a venial offence. Yet, irritated at the discouragement he had himself received, Dr. Lindley was an angry critic on Sir J. E. Smith, having even so recently as in his "Descriptive Botany," made a fresh attack on this eminent man for the use of Linnaean descriptive language, now, indeed, well known to be erroneous, but when employed nearly universal, and that when in this very work he was himself sanctioning inaccurate terminology without the apology that might be made for Smith. For our part, loving the memory of Smith, yet admiring and appreciating Lindley, and desiring to do justice to both, we regret what was wrong in feeling on either side, and would hand both names down to posterity as worthy to be honoured for eminent services to science. These few words are forced from us by the article on Lindley's death in the *Athenæum*, which is unfair and ungenerous towards Sir Jas. E. Smith. The scientific writings of Lindley make up a long catalogue. The *Botanical Register* enabled him to figure and describe many remarkable newly introduced plants. The "Genera and Species of Orchidaceous Plants," and the "Folia Orchidacea," evince his profound acquaintance with one of the most curious and attractive of the natural families of plants. His "Fossil Flora of Great Britain" is a beautiful application of botanical knowledge in aid of a sister science. The "Theory of Horticulture" is justly stated "to have done more to put gardening on its proper footing than any other work." His series of elementary works has very high merit, especially the "Introduction to Botany," "Elements of Botany," an admirable compendium of principles, "Descriptive Botany," and "Medical and Economical Botany." But amongst his greatest works was "The Vegetable Kingdom," a condensed account of the structure, geographical distribution and uses of plants. In this work he has given his account of the alliances or greater orders of plants, which are capable of affording the most valuable aid to students, and in determining and characterizing which he has upon the whole been eminently successful. That his peculiar arrangement has not been followed in works of detail is much more owing to DeCandolle's series having become familiar through the *Prodromus* than to any persuasion of its superior excellence. Lindley's is a truly great work. It may be improved upon, but it is not likely to be forgotten. As a philosophical botanist, a useful practical labourer, and a promoter and improver of the natural system in the study of plants, Dr. Lindley's fame is great and likely to be durable.

Amongst recent losses by death we have also to name Mr. Lovell Reeve, head of a publishing house in London, chiefly engaged in works on Natural Science, and himself a very eminent Conchologist, author of several important works on this science, especially the *Conchologia Iconica*, a series of Monographs on the genera of Molluscous animals furnished with shells, which takes the highest rank among works of its class, for its extent, beauty, and accuracy.

CANADIAN INSTITUTE.

EIGHTH ORDINARY MEETING—4th March, 1865.

Vice-President G. T. KINGSTON, M.A., in the Chair.

I. *The following donations for the Library were announced, and the thanks of the Institute voted to the donors:*

From J. M. Brodhead, Washington, D. C., U. S.:

Reports of Commissioner of Patents, 1861.

Arts and Manufactures, Vols. 1 and 2..... 2

From P. McGregor, Esq., Barrister, Toronto:

Bailey's Astronomical Tables, 1827..... 1

From Dr. Oldham, Superintendent of the Geological Survey of India:

Annual Report of the Survey and Museum, 1863-64, eighth year.

Annual Report of the Survey and Museum, 1862-63, eighth year; 1 pamphlet:

Memoirs of the Survey. Vol. 3, part 2.; 1 pamphlet

“ “ Vol. 4, part 2; 1 pamphlet.

From the Education Office, Upper Canada.

Remarks on the New Separate School Agitation. 1 pamphlet.

II. A Paper was read by the Rev. Prof. W. Hincks, F.L.S., &c.: “Thoughts on Belief and Evidence.”

NINTH ORDINARY MEETING—11th March, 1865.

The Rev. H. SCADDING, D.D., in the Chair.

I. A. G. McMILLAN, Barrister, Toronto, was elected a Member.

II. *The following Donations to the Library were announced by the Secretary:*

From Hon. J. M. Brodhead, Washington, D. C., U. S.

Report of the Superintendent of the Coast Survey, shewing the progress during the year 1862. Vol. 9, 1862-63. 1 volume.

Results of the Meteorological Observations made under the directions of the United States Patent Office and the Smithsonian Institution, from 1854 to 1859 inclusive. Vol. 2, part 1. 1 volume.

III. Oronhyatekha (a Mohawk Indian) read a Paper “On the Grammatical structure of the Mohawk Language.”

TENTH ORDINARY MEETING—18th March, 1865.

Vice-President M. BARRETT, Esq., M.A., M.D., in the Chair.

I. The following donations to the Museum were presented by S. Fleming, Esq., Civil Engineer:

One specimen of Iron Ore; one specimen of Pig Iron; one specimen of Bar Iron, from the Acadian Iron Works, Nova Scotia.

One specimen of Coal, from Newcastle River, near the head of Grand Lake, New Brunswick.

H. M. Barrett, Esq., M.A., M.D., read a Paper "On Bone, its History and Development."

ELEVENTH ORDINARY MEETING—1st April, 1865.

Rev. H. Scadding, D.D., in the Chair.

I. *The Auditors were appointed:*

By the Chairman, W. J. Macdonell, Esq; by the Meeting,

II. Dr. D. Wilson made some observations "On the changes of levels of land, especially of that part of Scotland between the Forth and Clyde."

EXTRA MEETING—21st April, 1865.

Vice-President M. Barrett, M.A., M.D., in the Chair.

I. *The following Donations received for the Library since the last Meeting were announced by the Secretary:*

The Transactions of the Royal Society of Edinburgh. Vol. XXIII., part 3, for the Session 1863-64. 1 vol.

Proceedings of the Royal Society of Edinburgh. Session 1863-64. 1 vol.

Journal of the Geological Society of Dublin. Vol. X., part 2. 1 vol.

II. Dr. D. Wilson exhibited a collection of specimens of flint, bone, and horn implements, and cave *Bremia*, found in the Drogne caves, in central France, by Mr. Christie, and transmitted by him to Dr. Thorburn, through whose kindness he was permitted to produce them.

III. Mr. S. McTavish, of the Hon. Hudson Bay Company, gave an account of the Esquimaux, and his experience in the north of the Hudson Bay Territory.

MONTHLY METEOROLOGICAL REGISTER, AT THE PROVINCIAL MAGNETICAL OBSERVATORY, TORONTO CANADA WEST, -AUGUST, 1865.
 Latitude—43 deg. 30.4 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.			Result. Direc-tion.	Velocity of Wind.			Rain in inches.	Snow in inches.			
	Mean.			10 P.M.				6 A.M.			2 P.M.			6 A.M.				2 P.M.					10 P.M.		
	6 A.M.	10 P.M.	Mean.	6 A.M.	10 P.M.	Mean.		6 A.M.	10 P.M.	Mean.	6 A.M.	10 P.M.	Mean.	6 A.M.	10 P.M.	Mean.		6 A.M.	10 P.M.	Mean.			6 A.M.	10 P.M.	Mean.
1	29.940	29.897	29.908	60.1	72.8	67.0	+ 0.73	376	545	509	66	81	74	E b s	E b s	E b s	3.8	7.0	0.5	3.72	3.78	...	...
2	29.896	29.800	29.847	67.0	78.5	72.8	+ 4.95	526	681	609	69	69	74	E b s	E b s	E b s	1.5	5.2	2.2	3.63	3.79	...	...
3	29.875	29.723	29.800	72.0	86.1	79.0	+ 8.82	657	710	684	80	68	75	E b s	E b s	E b s	1.0	10.0	0.0	2.17	3.58	0.085	...		
4	29.833	29.775	29.804	67.7	83.8	75.8	+ 0.05	557	569	562	81	78	79	N b w	N b w	N b w	2.5	1.2	0.0	1.82	1.96	0.130	...		
5	29.811	29.715	29.763	63.0	77.8	70.4	+ 4.33	450	565	475	59	67	67	N b w	N b w	N b w	6.2	2.0	0.0	0.39	2.95	...	...
6	29.808	29.715	29.761	67.7	73.8	70.8	+ 1.57	600	475	538	82	83	82	N b w	N b w	N b w	2.3	11.3	6.8	5.44	7.88	0.925	...		
7	29.824	29.764	29.794	62.7	72.0	67.4	- 1.09	415	343	378	43	70	82	N b w	N b w	N b w	8.0	19.0	0.0	9.06	9.29	...	...
8	29.822	29.763	29.792	62.3	72.8	67.6	- 0.93	367	488	419	44	75	70	N b w	N b w	N b w	1.5	4.5	0.0	1.95	2.19	inap.	...		
9	29.821	29.765	29.793	62.0	73.0	67.5	- 0.93	367	488	419	44	75	70	N b w	N b w	N b w	0.5	3.8	3.8	2.58	3.36	0.165	...		
10	29.872	29.808	29.840	67.4	77.1	72.3	+ 3.17	441	569	534	66	59	80	N b w	N b w	N b w	9.5	21.5	0.0	8.0	8.0	...	...
11	29.872	29.808	29.840	67.4	77.1	72.3	+ 3.17	441	569	534	66	59	80	N b w	N b w	N b w	12.0	10.8	0.0	8.0	8.0	...	...
12	29.881	29.866	29.874	64.4	66.3	65.4	- 8.83	358	368	363	76	67	86	N b w	N b w	N b w	6.6	2.0	0.0	0.01	1.59	...	...
13	29.851	29.712	29.781	40.3	71.3	55.8	- 6.50	308	418	353	73	64	66	N b w	N b w	N b w	0.0	0.0	0.0	0.00	0.00	...	...
14	29.858	29.617	29.737	66.4	76.0	71.2	+ 0.98	384	504	422	83	56	73	N b w	N b w	N b w	0.0	0.0	0.0	1.57	1.58	...	...
15	29.817	29.653	29.735	61.0	77.5	69.3	+ 5.12	381	540	391	453	69	57	62	N b w	N b w	N b w	0.8	2.0	2.5	2.46	4.83	...	...
16	29.840	29.651	29.745	63.7	72.8	68.2	+ 0.73	479	333	347	380	61	61	60	N b w	N b w	N b w	7.0	11.0	0.0	2.92	0.63	...	...
17	29.819	29.799	29.809	54.7	68.8	61.8	- 4.93	294	397	327	553	68	56	74	N b w	N b w	N b w	5.2	0.5	0.0	3.26	3.91	...	...
18	29.840	29.692	29.766	62.9	71.7	67.3	+ 1.70	306	463	437	76	60	73	N b w	N b w	N b w	3.0	4.2	0.2	1.42	1.88	...	...
19	29.860	29.615	29.737	59.8	70.7	65.3	+ 2.00	392	464	414	436	76	53	65	N b w	N b w	N b w	2.5	7.4	1.0	1.82	3.65	...	...
20	29.883	29.537	29.710	61.6	68.8	65.2	- 4.25	612	401	509	87	87	71	N b w	N b w	N b w	0.3	8.5	3.4	5.21	5.10	0.230	...		
21	29.827	29.397	29.612	64.1	72.4	68.3	+ 0.37	538	415	369	438	80	52	72	N b w	N b w	N b w	2.9	12.4	8.0	6.76	8.23	0.120	...	
22	29.850	29.512	29.681	52.9	64.5	58.7	- 7.07	285	263	295	283	71	43	65	N b w	N b w	N b w	6.0	3.5	11.0	6.85	7.81	...	...
23	29.808	29.729	29.768	46.8	60.1	53.5	- 11.97	261	233	235	254	81	44	67	N b w	N b w	N b w	0.0	16.0	0.2	7.07	7.17	...	...
24	29.855	29.786	29.821	48.2	64.8	56.5	- 8.18	253	362	308	307	71	59	74	N b w	N b w	N b w	6.0	9.2	2.0	3.45	4.98	...	...
25	29.837	29.797	29.817	53.6	71.2	62.4	+ 1.03	319	403	413	378	78	48	75	N b w	N b w	N b w	4.2	6.0	0.0	3.40	3.93	...	...
26	29.802	29.631	29.716	55.4	67.5	61.5	+ 3.12	391	407	494	463	89	52	74	N b w	N b w	N b w	0.0	12.0	2.5	6.05	6.79	...	...
27	29.797	29.707	29.752	58.3	70.2	64.3	+ 4.12	266	401	336	346	86	54	76	N b w	N b w	N b w	10.0	17.0	11.0	8.57	8.96	...	...
28	29.787	29.757	29.772	49.0	64.1	56.5	- 6.23	301	323	335	319	80	64	78	N b w	N b w	N b w	1.5	7.4	3.2	3.35	4.08	...	...
29	29.737	29.755	29.746	59.4	60.5	59.9	- 3.37	297	396	422	350	85	57	83	N b w	N b w	N b w	0.5	3.4	0.0	2.1	1.99	...	...
30	29.823	29.809	29.816	61.1	64.7	62.9	+ 1.15	396	466	473	449	85	67	78	N b w	N b w	N b w	0.0	7.0	2.5	3.83	3.98	...	...
31	29.809	29.702	29.755	60.5	86.1	73.3	+ 10.23	442	659	593	682	84	52	75	N b w	N b w	N b w	1.5	10.0	2.0	3.85	4.77	...	...
Mean	29.6957	29.6018	29.6483	59.68	72.32	66.03	- 0.58	390	465	421	454	79	57	73	...	...	...	3.45	7.85	3.10	...	5.07	1.990	...

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR AUGUST, 1865.

NOTE.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely, at 9 A.M., 8 A.M., 7 P.M., 5 P.M., 10 P.M., and midnight. The means and resultants for the wind are from hourly observations.

Highest Barometer 29.939 at 8 a.m. on 1st. } Monthly range =
 Lowest Barometer 29.308 at 2 p.m. on 6th & 10th. } 0.631 inches.

Maximum temperature 87° S on 3rd & 31st. }
 Minimum temperature 44° F on 24th. } Monthly range =
 43° F

Mean maximum temperature 74° 55' } Mean daily range = 19° 54'
 Mean minimum temperature 55° 42' }

Greatest daily range 36° S from a.m. to p.m. of 31st.
 Least daily range 7° 0 from a.m. to p.m. of 11th.

Warmest day 3rd Mean Temperature 76° 67' } Difference = 29° 50'
 Coldest day 23rd Mean Temperature 53° 17' }

Maximum { Solar 132° 5 on 3rd } Monthly range =
 Radiation { Terrestrial 31° 9 on 24th } 38° 5

Aurora observed on 8 nights, viz.—on 2nd, 4th, 12th, 14th, 16th, 18th, 22nd and 27th.
 Possible to see Aurora on 22 nights; impossible on 9 nights.

Raining on 8 days; depth 1.990 inches; duration of fall, 20.4 hours.
 Mean of cloudiness = 0.38; Most cloudy hour observed, 2 p.m.; mean = 0.44; least
 cloudy hour observed, 6 a.m.; mean = 0.30.

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

North. 1606.51
 South. 1024.25
 West. 612.74
 East. 1605.20

Resultant direction, N. 69° W.; Resultant Velocity, 1.55 miles per hour.
 Mean velocity 5.07 miles per hour.

Maximum velocity 26.3 miles, from 3 to 4 p.m. on 10th.
 Most windy day 10th—Mean velocity 14.91 miles per hour. }
 Least windy day 13th—Mean velocity 0.60 miles per hour. } Difference 14.91

Most windy hour, 1 p.m.—Mean velocity, 8.35 miles per hour.
 Least windy hour, 8 p.m.—Mean velocity, 3.06 miles per hour. }
 Difference 5.29 miles.

2nd. Splendid aurora during night. 3rd. Lightning during evening.
 4th. Splendid auroral display, accompanied by a great magnetic disturbance.
 8th. Distant thunder.

12th. Auroral light and streamers; a number of shooting stars observed.
 15th. Lightning during evening. 20th. Distant thunder.

22nd. Solar halo. 30th. Solar halo during morning. 31st. Lunar halo.
 Dew recorded on ten occasions during month.

The month of August was cool, dry, and clear. The velocity of the wind differed
 little from the average.

COMPARATIVE TABLE FOR AUGUST.

YEAR.—Mean.	TEMPERATURE.		RAIN. Inches. No. of days.	SNOW. Inches. No. of days.	WIND.					
	Excess Above Average	Maximum Observed			Minimum Observed	Range.	Resultant Direction, velo city.	Mean Force or Velocity		
1840	1.5	80.1	47.4	32.7	12	2.905	...	...	...	0.19188
1841	1.8	83.5	46.7	36.8	9	0.170	...	...	...	0.39 "
1842	0.5	80.7	45.3	35.4	6	2.500	...	...	...	0.12 "
1843	+ 0.2	85.5	44.4	41.1	4	4.856	...	...	...	0.16 "
1844	1.9	82.5	44.3	38.2	17	imppr	...	...	...	0.19 "
1845	+ 1.7	82.5	44.4	38.1	9	1.725	...	...	...	0.19 "
1846	+ 2.2	85.3	56.4	35.9	9	1.770	...	...	...	0.17 "
1847	1.1	83.1	44.9	38.2	10	2.149	...	...	...	0.19 "
1848	+ 3.0	87.5	49.3	38.2	8	0.853	...	...	S 21 E 0.9	4.55 ms
1849	+ 0.1	79.5	51.4	28.1	10	4.970	...	...	S 71 W 0.69	3.76 "
1850	+ 0.6	84.2	43.0	41.2	13	4.355	...	...	N 15 E 0.35	4.48 "
1851	63.6	79.8	43.6	36.2	10	1.566	...	...	S 63 W 0.40	4.63 "
1852	65.9	81.2	46.7	34.5	9	2.695	...	...	N 70 E 0.56	3.30 "
1853	+ 2.4	91.6	47.6	44.0	11	2.575	...	...	S 36 E 0.30	4.25 "
1854	+ 1.8	98.1	47.0	51.1	5	0.455	...	...	N 64 W 1.76	4.60 "
1855	64.1	82.1	44.9	37.2	7	1.455	...	...	N 63 W 1.04	6.37 "
1856	63.6	81.3	44.0	37.3	12	1.680	...	...	N 50 W 2.58	7.63 "
1857	63.3	85.3	50.1	35.2	13	5.265	...	...	N 77 W 1.51	6.35 "
1858	67.6	83.4	45.4	38.0	11	3.899	...	...	N 69 W 1.57	6.50 "
1859	66.6	81.4	46.2	35.0	11	3.990	...	...	N 36 W 1.69	5.96 "
1860	64.5	81.8	47.1	34.7	14	3.463	...	...	N 70 W 1.83	5.80 "
1861	65.5	82.5	48.2	34.3	15	2.953	...	...	N 8 E 0.46	4.21 "
1862	67.6	87.6	47.7	39.9	15	3.483	...	...	N 78 W 1.67	5.90 "
1863	66.6	+ 0.4	82.6	43.0	12	2.068	...	...	S 61 W 1.30	4.69 "
1864	68.6	+ 2.4	87.6	44.0	16	5.200	...	...	N 70 W 1.38	4.75 "
1865	65.2	1.2	86.1	46.8	8	1.990	...	...	N 60 W 1.55	5.07 "
Result to 1864.	...	84.45	46.50	37.55	10.7	3.026	...	...	N 67 W 0.93	5.18
Exc. for 1865.	...	+ 1.65	+ 0.30	+ 1.35	2.7	1.036	...	...	...	-0.11

MONTHLY METEOROLOGICAL REGISTER, AT THE PROVINCIAL MAGNETICAL OBSERVATORY, TORONTO, CANADA: WEST.—SEPTEMBER, 1865.
 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°.			Temp. of the Air.			Excess of mean above Normal.			Tens. of Vapour.			Humidity of Air.			Direction of Wind.			Velocity of Wind.			Re-sultant Direc-tion.	Rain in Inches.	Snow in Inches.		
	MEAN.			MEAN.			MEAN.			MEAN.			MEAN.			MEAN.			MEAN.							
	6 A.M.	10 P.M.	2 P.M.	6 A.M.	10 P.M.	2 P.M.	6 A.M.	10 P.M.	2 P.M.	6 A.M.	10 P.M.	2 P.M.	6 A.M.	10 P.M.	2 P.M.	6 A.M.	10 P.M.	2 P.M.	6 A.M.	10 P.M.	2 P.M.				6 A.M.	10 P.M.
1	29.700	29.658	29.627	71.3	77.8	77.8	63.0	70.32	+ 7.32	651.659	462.578	86	69	80	78	SW by W	SW by W	SW by W	3.8	5.0	0.8	1.66	3.61	Imp.		
2	603	558	555	61.6	77.4	77.4	65.6	69.20	+ 6.47	331.571	492.494	69	61	78	69	NW by W	E by N	E by N	1.6	5.6	4.0	3.48	3.76	...		
3	606	550	550	63.2	80.3	80.3	69.1	77.4	+ 6.47	497.674	...	80	63	65	73	Calm.	SSE	SSE	0.0	6.6	2.0	3.29	3.37	...		
4	629	575	558	67.0	83.4	83.4	73.1	75.65	+ 13.52	566.771	568	86	64	72	73	Calm.	SW by S	SW by S	0.0	12.8	2.0	4.86	4.93	...		
5	535	539	568	67.0	86.2	86.2	68.8	74.38	+ 12.53	666.421	509	85	63	58	62	Calm.	W by S	W by S	0.0	5.8	0.0	2.11	3.73	0.030		
6	549	511	528	61.6	74.9	74.9	63.4	67.42	+ 5.98	468.476	417	85	63	71	67	Calm.	SW by W	SW by W	0.2	7.4	1.6	4.38	5.05	...		
7	565	543	532	58.7	79.6	79.6	69.9	70.78	+ 9.03	384.605	527	85	72	69	72	SW by W	S by W	S by W	2.2	8.0	0.0	3.00	6.21	...		
8	601	477	503	51.7	69.1	69.1	64.1	61.43	+ 0.70	439.476	565	84	92	94	89	E by N	E by N	E by N	10.0	19.2	4.0	10.67	10.80	0.500		
9	557	583	661	64.5	69.0	69.0	62.3	65.68	+ 5.53	586.612	516	91	82	90	91	E by N	E by N	E by N	8.0	1.0	0.0	0.67	3.25	Imp.		
10	708	624	661	61.6	76.0	76.0	63.7	69.87	+ 10.22	493.588	...	90	63	73	76	SW by W	SW by W	SW by W	3.0	2.0	0.0	0.90	2.10	Imp.		
11	491	555	615	59.5	77.1	77.1	67.0	67.43	+ 8.20	651.685	400	92	73	68	76	SW by W	SW by W	SW by W	1.5	7.2	0.0	2.07	3.17	0.015		
12	725	769	773	76.0	55.1	55.1	63.1	31.8	+ 8.20	331.318	489	76	57	73	61	WNW	ESE	ESE	1.0	3.5	1.5	2.73	3.44	...		
13	815	811	808	81.25	65.9	65.9	70.6	71.15	+ 12.30	567.529	532	59	57	71	71	E by N	ESE	ESE	3.2	3.0	4.2	2.94	2.29	...		
14	743	654	706	70.03	65.6	65.6	73.5	57.12	+ 16.78	599.711	637	95	53	78	78	Calm.	WNW	WNW	0.0	11.8	0.0	3.69	5.23	0.005		
15	817	833	900	86.52	61.9	61.9	66.6	67.33	+ 9.42	451.311	352	82	39	54	54	Calm.	SW by W	SW by W	0.0	8.8	2.0	2.29	4.11	...		
16	868	841	697	61.9	72.4	72.4	64.1	64.70	+ 7.18	590.440	486	81	75	81	67	Calm.	SW by W	SW by W	0.0	0.5	0.0	0.36	6.96	0.910		
17	614	683	697	67.7	69.5	69.5	67.7	69.5	+ 4.85	385.632	...	87	58	55	57	SW	Calm.	NE by E	1.0	0.0	10.6	5.37	6.96	...		
18	745	779	814	70.40	45.7	45.7	50.8	52.27	+ 4.85	239.221	212	222	78	43	56	57	SW	Calm.	NE by E	0.0	0.0	0.0	4.90	4.95	...	
19	821	877	845	87.76	43.2	43.2	54.4	51.50	+ 1.63	235.274	362	206	83	48	60	71	NE	SW	SW	7.5	10.0	0.0	3.45	3.94	...	
20	853	774	786	77.98	50.4	50.4	68.4	59.83	+ 4.23	330.533	401	417	90	77	83	81	SW	SW	SW	2.8	5.2	2.5	3.65	3.76	...	
21	765	762	778	76.55	54.4	54.4	65.5	60.161	+ 5.03	385.506	461	451	91	80	89	84	SW	SW	SW	1.0	6.0	1.6	1.13	1.33	Imp.	
22	815	831	869	83.87	59.8	59.8	63.4	65.08	+ 10.49	428.581	521	523	83	79	89	84	SW	SW	SW	0.4	6.5	0.5	1.69	2.15	...	
23	895	882	808	84.35	63.0	63.0	62.3	64.23	+ 10.02	539.569	522	529	93	81	93	88	E	ESE	ESE	2.8	6.0	0.6	2.31	2.35	...	
24	747	685	661	58.3	66.3	66.3	58.3	66.3	+ 8.25	476.618	...	98	95	95	85	Calm.	SW by S	SW by S	0.0	4.0	6.1	3.42	3.94	0.855		
25	609	648	765	68.38	47.3	47.3	55.1	61.49	+ 8.25	403.527	319	400	86	69	78	73	WNW	WNW	WNW	1.6	13.6	5.0	3.18	8.53	...	
26	873	947	933	91.23	64.6	64.6	49.7	50.72	+ 2.20	261.256	317	256	90	64	89	81	SE by S	SE by S	SE by S	7.0	5.2	2.0	2.63	3.92	...	
27	30.012	890	966	96.65	46.1	46.1	62.3	62.61	+ 5.57	242.348	364	338	90	62	92	81	SE by S	SE by S	SE by S	2.0	7.6	4.0	4.43	4.51	...	
28	29.988	915	845	91.18	49.3	49.3	58.0	58.88	+ 7.05	323.471	428	414	91	68	89	83	E	E	E	1.2	9.8	3.8	1.94	1.93	...	
29	797	681	585	68.03	53.3	53.3	78.1	64.84	+ 12.72	399.555	528	496	95	63	87	84	E	E	E	3.0	7.6	4.0	3.24	4.43	0.045	
30	546	510	450	50.72	59.0	59.0	55.8	59.47	+ 8.65	451.353	290	332	90	64	69	69	W by S	W by S	W by S	0.0	8.0	6.6	5.61	6.87	...	
MEAN	29.7360	29.7097	29.7116	71.171	51.62	51.62	35.64	49.49	+ 7.00	435.496	446	453	86	63	78	75	2.40	6.52	2.31	4.12	2.450

REMARKS ON TORONTO METEOROLOGICAL REGISTER FOR SEPTEMBER, 1865.

COMPARATIVE TABLE FOR SEPTEMBER.

YEAR.	TEMPERATURE.					RAIN.		SNOW.		WIND.	
	Mean.	Excess above average.	Max. of day.	Min. of day.	Range.	No. of days.	Inches.	No. of days.	Inches.	Direction.	Force or Velocity.
1840	54.0	- 3.8	70.2	29.4	40.8	4	1.38	...	...	...	...
1841	61.3	+ 3.5	79.9	37.5	42.4	9	3.31	...	...	...	0.26 lbs.
1842	65.7	+ 2.1	83.5	28.3	55.2	12	0.160	...	...	...	0.45
1843	59.1	+ 1.3	87.8	33.1	54.7	10	9.766	...	...	...	0.57
1844	58.6	+ 0.8	81.5	29.6	51.9	4	Imp.	...	...	...	0.26
1845	56.0	+ 1.5	78.8	35.3	43.5	16	6.213	...	...	...	0.31
1846	63.6	+ 5.8	84.0	39.0	45.0	11	4.555	...	...	...	0.33
1847	55.6	+ 2.2	74.8	38.1	36.7	15	6.665	...	...	...	0.33
1848	51.2	+ 3.6	80.9	29.5	51.4	11	3.111	...	...	N 71° W	2.38
1849	53.2	+ 0.4	80.6	33.5	47.1	9	1.489	...	...	N 75° W	0.69
1850	56.5	+ 1.3	76.0	31.7	44.3	11	1.735	...	...	S 65° W	1.02
1851	60.0	+ 2.2	86.3	33.4	52.9	9	2.665	...	...	N 14° E	1.03
1852	57.5	+ 0.3	81.8	36.1	45.7	10	3.631	...	...	N 77° W	1.53
1853	58.8	+ 1.0	85.4	36.1	49.3	12	5.141	...	...	N	1.06
1854	61.0	+ 3.2	93.1	36.3	56.8	14	5.573	...	...	N 23° W	1.33
1855	59.5	+ 1.7	81.7	36.1	45.6	12	5.588	...	...	N 20° E	1.29
1856	57.1	+ 0.7	77.8	37.4	39.9	13	4.105	...	...	S 79° W	1.98
1857	58.0	+ 0.5	81.4	34.1	47.3	11	2.610	...	...	S 68° W	1.61
1858	59.1	+ 1.5	80.1	36.5	43.3	8	0.735	...	...	S 74° W	1.53
1859	55.2	- 2.6	73.8	35.7	38.1	15	3.625	...	...	N 44° W	1.60
1860	55.3	- 2.5	74.2	28.7	45.5	14	1.959	...	...	N 71° W	2.63
1861	59.1	+ 1.3	78.2	37.1	41.1	17	3.607	...	...	N 70° W	1.39
1862	59.6	+ 1.8	78.9	41.0	37.9	9	2.344	...	...	N 58° W	1.07
1863	55.9	- 1.9	78.2	31.6	46.6	8	1.233	...	...	N 16° W	0.92
1864	56.4	- 1.4	72.4	41.0	31.4	11	2.508	...	...	N 33° W	1.89
1865	64.5	+ 6.7	87.2	43.2	44.0	12	2.450	...	...	S 56° E	0.47
1866	57.84	...	80.03	34.06	45.38	11.0	3.736	...	...	N 57° W	1.16
1867	6.65	+ 6.17	+ 8.54	1.38	1.80	1.0	1.280	...	...	.....	1.42

Note.—The monthly means do not include Sunday observations. The daily means, excepting those that relate to the wind, are derived from six observations daily, namely at 6 A.M., 9 A.M., 3 P.M., 6 P.M., 10 P.M., and midnight. The means and results for the wind are from hourly observations.

Highest Barometer.....30.021 at 8 a.m. on 27th } Monthly range =
 Lowest Barometer29.443 at 2 p.m. on 8th } 0.578 inches.
 Maximum Temperature.....90° on 14th } Monthly range =
 Minimum Temperature.....49° on 19th } 48°
 Mean maximum Temperature.....74°07 } Mean daily range =
 Mean minimum Temperature.....57°10 } 16°97
 Greatest daily range.....24°59 from a.m. to p.m. of 14th.
 Least daily range.....6°5 from a.m. to p.m. of 30th.
 Warmest day.....4th.....Mean temperature.....75°65 } Difference = 24°93
 Coldest day.....26th.....Mean temperature.....50°72 } Monthly range =
 Maximum { Solar.....126° on 5th and 14th } 91°5
 Radiation. { Terrestrial.....35° on 16th }
 Aurora observed on 7 nights, viz:—11th, 12th, 15th, 16th, 18th, 20th, and 26th.
 Possible to see Aurora on 23 nights; Impossible on 7 nights.
 Raining on 12 days, depth 2.450 inches; duration of fall 39.2 hours.
 Mean of cloudiness = 0.39.
 Most cloudy hour observed, 8 a.m.; mean = 0.54; least cloudy hour observed, 4 and 10 p.m.; mean, = 0.30.

Sums of the components of the Atmospheric Current, expressed in miles.
 North. South. East. West.
 790.22 1136.83
 978.45 854.03
 Resultant direction S. 56° E.; Resultant velocity 0.47 miles per hour.
 Mean velocity.....4.12 miles per hour.
 Maximum velocity.....20.0 miles, from 4 to 5 a.m. of 15th.
 Most windy day.....8th.....Mean velocity, 10.80 miles per hour. } Difference =
 Least windy day.....16th.....Mean velocity, 0.46 ditto } 10.34 miles.
 Most windy hour.....11 a.m.....Mean velocity, 6.88 ditto } Difference =
 Least windy hour.....10 p.m.....Mean velocity, 2.17 ditto } 4.71 miles.
 1st. Solar halo. 3rd. Sheet lightning at night.
 4th. Dense fog during morning. 6th. Lunar halo. 7th. Lunar halo.
 12th. Hoar frost at 5 a.m. 13th. Sheet lightning at night.
 14th. Ground fog at 6 a.m.; very sultry day; sheet lightning at night.
 17th. Thunder-storm, 10 a.m. to 1 p.m.; dense fog at night.
 19th. Hoar frost, 6 a.m. 20th. Fine solar halo.
 23rd. Considerable number of shooting stars observed.
 24th. Thunder-storm during forenoon. 29th. Dense fog, 6 a.m.; lightning at 4 p.m.

September, 1865, was warm, dry, calm, and clear. The mean temperature was the highest recorded, the only previous September approaching to it being 1846.

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