An inaugural lecture on the study of botany : read in the library of the Botanic Garden, Oxford, May 1, MDCCCXXXIV [1834] / The plans are of the Oxford Botanic Garden.

AN

INAUGURAL LECTURE

ON THE

STUDY OF BOTANY,

READ IN

THE LIBRARY OF THE BOTANIC GARDEN,

OXFORD,

MAY 1, MDCCCXXXIV.

BY

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TO THE

PRESIDENT AND FELLOWS

OF

THE ROYAL COLLEGE OF PHYSICIANS IN LONDON

THIS LECTURE

IS INSCRIBED

BY THEIR MOST OBLIGED

AND HUMBLE SERVANT

THE AUTHOR.

INAUGURAL LECTURE.

GENTLEMEN,

IT is now nearly twelve years, since I first had the honour of addressing you in consequence of my appointment to the chair of Chemistry in this University, and well do I recollect the mingled feeling of pride and of distrust, which at that time possessed my mind, as I first entered upon the functions of an office, which occupied so high a place in my estimation.

If, on the one hand, I conceived myself elevated in station, as a man of science, in proportion to the sense I entertained of the character and reputation of the Academic body amongst which I held my appointment, I, on the other hand, could not but be oppressed, with an anticipation of all that would be expected from me, and with a consciousness of the limited talents and means I could command, for realizing worthily such expectations.

A Professor indeed in this University, if he be connected with any one of the modern sciences, is placed in a peculiar, and in some respects a painful position ; the very splendour and importance of the Academic body itself,—the circumstance that this, and one other University, were until lately the only recognized places of general education which this country possessed,—and the long train of illustrious names which Alma Mater has to boast in those departments of learning which she effectively encourages, render a higher standard of reputation and a larger amou

of attainment looked for from those persons, who hold appointments connected with other branches of liberal knowledge which she is presumed to foster.

If Berlin possesses a Rose and a Mitscherlich, if Göttingen boasts of a Stromeyer, and Glasgow of a Thomson, men whose whole lives have been devoted to the cultivation of that one science which they are appointed to teach, who have expounded its truths to crowds of attentive disciples, and have extended its domain by their original inquiries and labours, in what light will the public regard an individual, holding a similar office to theirs in an University, more considerable in point of numbers, more richly endowed, and occupying a position altogether more conspicuous than either of the above, who nevertheless should be known by no important contribution to science, and should attract to his class-room only a scanty audience.

Will they not be apt to measure his qualifications, by the standard of those distinguished philosophers who hold similar situations in other parts of Europe, and think meanly of talents in a Professor, which might perhaps have been looked upon as respectable in a private indidual?

Yet, on the other hand, those, who are aware of all the circumstances of the case, will be inclined to admit, that that entire devotion of mind to the pursuits of science, which has enabled the individuals above alluded to to reach the eminence upon which they stand, can hardly be looked to from the Professor in this University, who, unless he should be fortunate enough to possess some independent resources, must consent to regard the pursuit of Chemistry as a subordinate object to that of Medical practice, seeing, that the most assiduous discharge of his duties as Professor, the most felicitous mode of expounding the truths of science in his capacity of Lecturer, and even the most signal success as an Experimentalist, can

never, under the existing regulations, enable him to realize from his Professorship a pittance sufficient to meet even the most moderate views in life.

I feel the more anxious to make this declaration, when I look back upon the twelve years that have elapsed since I attained the chair of Chemistry, and reflect how little I have accomplished in that department of science, compared to what might have been expected, by persons uninformed as to these circumstances, of one called by the voice of the University to fill so responsible an office. I am also more particularly induced to allude to it, inasmuch as it will serve to explain, how it has happened, that, notwithstanding the humble nature of my pretensions, I should yet have presumed to aspire to another post of honour, and that I should have been encouraged in my application for it, by the good wishes, and by the friendly exertions, of so large a body of my academical friends.

To have secured the favourable testimony of those who have had the best opportunities of watching my conduct, to be assured that my humble endeavours to forward, so far as in me lay, the cause of modern science within the walls of Oxford, have met with the approval, and have secured me the support of the many excellent and distinguished individuals who expressed their sentiments towards me on the occasion alluded to—an expression, which could not but give weight to my claims in the eyes of the learned body to which the appointment is intrusted, I shall ever consider, as one of the most gratifying events of my life.

Unquestionably, however, no partial feeling towards myself on their part, and no honourable ambition to attain an higher eminence in science on mine, would have justified a testimonial given with reference to such an object, or would have entitled it to any weight with the electors, had the professorship which I already enjoyed, furnished its possessor with the means of employing the undivided

energies of his mind in the advancement of chemical science.

This however, it is known by most persons present, though unfortunately not so well understood by the public, is far from being the case; and hence, there will at least be no injury sustained by science, if the Professor, instead of procuring, to put a favourable case, from the fruits of his Medical practice, the means of prosecuting his Chemical inquiries, is allowed in Oxford to combine, with the duties of his former office, those of another, not more richly endowed, nor more capable of flourishing independently. And if it should appear, that there is a certain connexion between the duties of the two appointments now united in my person; if it can be shewn, that there are particular inquiries of a Chemical nature which can scarcely be prosecuted without the assistance of a Botanical Garden, and that some of the most important problems now pending in vegetable physiology require for their elucidation the aid of Chemical science; I trust that those even, who consider the question as to my appointment purely upon its own merits, and without those feelings of partiality, by which I am pleased to believe the opinion of the present audience may have been swayed, will yet be reconciled to a result, which at least secures to the general cause of modern science in this University, all the resources and energies which I can command for its advancement.

Let me then, without further preface, attempt to lay before you such an outline of the present condition of Botany, as may serve to shew, that it has gradually elevated itself to that rank amongst the natural sciences, in which the skill and ability, required for the discrimination of species, constitutes only a subordinate qualification for success—in which higher powers of the mind are called into requisition than those of tact and memory—in which

the study of the writings of the persons, who have of late most materially advanced its progress, will afford some of the best illustrations of those principles of inductive reasoning which are unfolded to us by logicians—in which the structure and functions of the individual members of the vegetable kingdom are viewed, not as insulated objects of idle wonder and curiosity, but as parts of one great system, carrying on certain processes in common, where the laws of Mechanics and of Chemistry may be traced in constant operation.

If such be the case, it will be readily allowed, that talents and attainments, which seem at first sight to have no reference to systematic Botany, may become available in the inquiries now undertaken, and that modes of investigation, which formerly were considered quite alien from the subject matter, which we profess to consider, may now be deemed of the highest importance.

In every department of knowledge it may be observed, that the popular and established method, in which it is prosecuted, furnishes a pretty fair criterion of the state of its progress towards maturity.

Mankind, by a sort of instinct, rather than by a direct consideration of the most advantageous mode of attaining their object, tacitly agree, in conferring the meed of their approbation, upon success in that particular branch of research, which the existing condition of the study most imperiously demands.

To shew, that this was the case with reference to the study of the classical writers of antiquity, in the overweening importance attached to excellence in the technicalities of scholarship, before the labours of successive commentators had smoothed the way to an easier mastery of their contents, would lead us too far; but confining ourselves to the subject before us, it may be remarked, that there must be a certain period in the growth of every branch of natural history, and even of what is called

physical science, when it is most advantageous, that we should confine ourselves to the mere accumulation of facts, and during which all attempts at generalization are precluded by the scantiness of data.

This period may be more or less protracted, in proportion to the extent and complication of the objects embraced by the science in question, but it must always be passed through; and when once we discover, that the taste of its cultivators no longer finds an exclusive gratification in the determination of species; that it attaches an interest to their mutual analogies and relations; that it is disposed to give a preference to those modes of classification and arrangement which are founded on this principle, in preference to others which recommend themselves by their facility; we may feel pretty sure, that the study is no longer in its infancy, but has already attained some considerable development.

Now botany, as understood by most persons until lately, and by many in this country even now, consists in little more, than in the art of recognizing with ease and certainty a number of different plants, when presented to our examination; a faculty no doubt of considerable utility to the possessor, as it enables him to proceed without impediment to the investigation of such useful qualities as they may severally possess, whether it be in medicine, agriculture, or the arts.

To determine species correctly, some kind of method is obviously required, for the skill, which the uneducated rustic often possesses, in recognizing plants by their general port and aspect, or by some arbitrary mark or character impressed upon them, is of course very circumscribed in its application, and extremely liable to mistake.

What, however, the method may be which we employ, is obviously a matter of indifference, the sole test of its comparative utility being, the greater or lesser readiness, with which it enables us to ascertain the names of the plants

that fall in our way. It was the peculiar happiness however of the Linnæan method of classification, that whilst furnishing us with an easy key to the names of a great variety of plants, it at the same time grouped together, in a great number of instances, those which are naturally allied. Had not this been the case, it is impossible to imagine, that its success and popularity could have been so marked; for every botanist must, in spite of himself, class together in his mind the plants, with which he is acquainted, in some degree according to their obvious relations and affinities, and would feel a repugnance to any method, in which species the most dissimilar, and the most incongruous, were brought together throughout, as in all artificial systems may, and in many does, actually occur. The Linnæan system likewise recommends itself to our favour, inasmuch, as at the very time that we are employed in the almost mechanical act of discovering, by the number of its stamens and pistils, what a plant is, we are reminded continually, by the very principles on which we proceed, of that beautiful discovery with regard to the sexuality of plants, which imparts a new source of interest to their functions, and gives us, as it were, a sort of sympathy in their existence.

> Vivunt in Venerem frondes, omnisque vicissim
> Felix arbor amat, nutant ad mutua palmæ
> Fœdera, populeo suspirat populus ictu,
> Et platani platanis, alnoque assibilat alnus. *Claudian, De Nupt. Honor. & Mar. v. 65.*

But the Linnæan system, with all its elegance and convenience, is after all, as its inventor was well aware, a merely artificial method, which supplies us only in part, and, as it were, by accident, with that information with respect to the relations of one plant to another, by which alone its place in the great system of nature can be determined. Hence the exclusive attention paid to this method was at first an effect, and afterwards perhaps became a cause, of the cir-

cumstance, that botany continued in that immature condition, in which a knowledge of species, or in other words the accumulation of data for future generalizations, was alone needed and encouraged.

Had such been the main scope and acknowledged condition of botanical science in the present day, I should, it must be owned, but ill deserve to appear before you as your instructor in it, for I can neither lay claim to a sufficiently accurate and extensive knowledge of species at present, nor can boast, I fear, of that quickness of eye and tact, which should enable me hereafter to acquire distinction, as a systematic botanist.

I question, however, whether these qualifications, though, as subsidiary to higher objects, they are of no mean importance, ought to rank amongst the most valuable endowments, which a botanical lecturer can possess; still less ought they, I am disposed to hope, to be regarded, as indispensable to the due fulfilment of his duties.

I flatter myself, that an anxious desire to inspire others with a genuine love of scientific truth, and a constant endeavour to explain the structure and functions of plants, by calling into their illustration the aid of other branches of science, may, if conjoined with a sufficiently correct and comprehensive insight into the great principles, upon which they are collected into natural groups, and of the general relation, in which these latter stand towards each other, render me not altogether unworthy of the partial feeling you have expressed on my behalf, and of the preference which the College of Physicians has evinced towards me in my election.

The time indeed seems at length arrived, when a more philosophical arrangement of the multitudinous objects, which present themselves to us in our survey of the vegetable kingdom, seems feasible—when, instead of resting satisfied with the mode of classification established by Linnæus, in which the individuals grouped to-

gether possess no necessary resemblance in structure, our primary object should be, to bring together those species, which offer the most numerous and important analogies one to the other, in the hopes hereafter of constructing a system, where the very place which the plant occupies in it shall in a manner announce, its most prominent characters, the virtues which it may possess, and its affinities with others. Such are the principles, upon which botany is at present taught, both at Cambridge by Professor Henslow, and in London by more than one lecturer, amongst whom I may particularly mention that distinguished naturalist Professor Lindley, whose lectures I have myself had the advantage of attending.

This gentleman, however, from the confidence inspired by a thorough mastery of his subject, has undertaken a task upon which I shall not venture, namely, that of discarding the Linnæan system altogether, and shewing how to discriminate plants purely according to the principles of the natural system. In my case on the contrary I shall deem it most expedient, first to point out the manner of employing the Linnæan method as a dictionary, hoping however, that as you proceed, you will see reason to appreciate the higher pretensions of that mode of classification, which attempts to group together the objects which it considers according to their natural affinities.

Of the merits and importance of this latter undertaking no one could be more sensible, than was Linnæus; but the groundwork, on which a natural classification required to be based, could not be otherwise than insecure, until more extended researches into the structure of plants had been instituted, than was the case, at the period, at which he proposed an outline of such a scheme.

The important generalization of Desfontaine[a] with respect to the essential differences pervading plants with

[a] Mémoires de l'Institut. vol. i.

one cotyledon and with more[a], a doctrine which forms as it were the keystone of the natural system, and holds the same rank in botany, which the discovery of the circulation of the blood, or the distinction between vertebrated and invertebrated animals, does in zoology, had not at that time been made known.

Ignorant of this fundamental difference, botanists had imagined a kind of scale of beings to exist, commencing with the lowest order of vegetables, and terminating in man; whereas it is now evident, that, even if we confine ourselves to the more perfectly organized plants, we must suppose at least two such systems, each one divisible into smaller groups, but these so connected with many others, as to baffle all attempts to arrange them in a linear series.

Thus certain families of dicotyledonous plants present analogies, not only with many others belonging to the same great natural division, but also with certain even of the monocotyledonous tribes; and, to put a still stronger case, the plants without cotyledons, whose structure is of the simplest kind, and the mode of whose reproduction is least understood, find their nearest counterparts, not amongst the vegetable kingdom, but in certain organic beings, which lie at the bottom of the scale of the animal creation.

Thus, though it is intended, that the classes, families, genera, and species should be natural, yet the order in which they are made to follow each other cannot be otherwise than artificial.

On paper the only possible order of arrangement is a linear one, whilst it is quite evident, that each species presents affinities with so many other species, each genus with so many other genera, and each family with so many other families, that the only plan of representing, or expressing, the relation in which they stand one towards

[a] Theophrastus, however, seems to have been aware of the distinction, from a passage quoted by Professor Lindley in his Inaugural Lecture.

each other, is by a kind of map, in which the classes should stand towards each other, as the quarters of the world do on an artificial globe, including the families as separate countries, their genera as provinces, their species as districts. As on the map each district touches many others at distinct points, so likewise do the families in the vegetable kingdom: as the individuals in each district agree in so many particulars with the inhabitants of the neighbouring districts, as to be scarcely recognizable from them, so also do the species composing various allied genera. Mons. Decandolle has followed up the comparison much further than I have time to do, extending it to various other particulars; and it is possible, that a kind of map will hereafter be constructed of the whole vegetable kingdom, upon the principle which has just been suggested.

But how, it may be asked, are we to know, that a classification founded upon the number and relative position of the cotyledons is more natural, than one which might be based on any other difference in structure? and why are we to consider it in any other light, than as an arrangement adopted for convenience sake, and therefore as liable to be superseded, as other arbitrary methods have been, which preceding naturalists had invented?

An answer to this inquiry will be supplied by the perusal of the admirable work of Professor Decandolle, entitled "Théorie Elémentaire de la Botanique," a work which I am surprised not to find, translated into our language, and more frequently quoted by English botanists, seeing that there is, so far as I know, no treatise which can exactly supply its place, or which is written with the same precise object. I may perhaps appear to you to entertain an exaggerated notion of its merit, in saying, that I consider it to hold the same relation to botany, which the treatise of Sir John Herschel, or the Novum Organum of Bacon, do to experimental science in general, laying down on general principles the laws, according

to which the several species of plants ought to be grouped together, and referring to these principles the maxims, which have guided preceding naturalists in their attempts at classifying them.

Mons. Decandolle sets out with this axiom, that a method of arrangement, in order to be fully established as a natural one, ought to be based at once upon the organs of nutrition and of reproduction; that is to say, that if the distinction which is perceived between two species of plants be a fundamental one, it ought to be discovered to exist, on a comparison of some essential organ belonging to their reproductive system, as well as on one of those subservient to their nutrition.

Now the distinction between monocotyledonous and dicotyledonous plants is according to this rule an highly natural one, extending to the most important organs concerned in the nutrition of the plant, as well as its reproduction. To explain this, it will be necessary to take for granted, what will be proved in the course of the lectures I am about to deliver; namely, that all the organs of which a vegetable consists, may be shewn to belong to, or in other words to be modifications of, the root, the stem, or the leaves, and that each of these parts exist in a rudimentary condition in the seed, the radicle representing the first, the plumula the second, and the cotyledons the last of the organs mentioned.

Now in the embryo contained in the seed of a dicotyledonous plant, all these three parts may be distinguished previous to germination, and when that process has commenced, the radicle shoots downwards, the plumula mounts upwards, and the cotyledons expand.

On the other hand, in the monocotyledonous embryo, there exists before germination no obvious distinction of parts, and after its commencement, the cotyledon still remains within the integument or testa of the seed, whilst the lower part lengthens, and gives rise at once to the stem

and the roots. But the main difference is that which exists with respect to the number and position of the cotyledons, and it is this accordingly, which has given to the two classes their distinctive names.

In the first of these classes there is most commonly only one cotyledon, and in those rare cases in which there are more, they are placed alternately, and never opposite. Hence these plants are called monocotyledonous. In the second class on the contrary there are always two cotyledons, and in a few cases several; but whatever the number may be, they are always placed opposite. These plants are accordingly denominated dicotyledonous.

Now the plants, which are derived from seeds possessing the characters above represented, are remarkably contrasted in the aspect and structure of all their essential organs of nutrition.

In dicotyledonous plants, the root is single at its base or origin, however much it may afterwards ramify; in monocotyledonous on the contrary, roots spring at once in large numbers from the collar or life knot at the base of the stem, so that it is impossible to fix upon any one, from which the others can be said to be more particularly derived.

The structure of the stem in these two cases is still more strikingly contrasted. In the dicotyledonous it is composed of two distinct parts, the bark and the wood, the former of which grows by the apposition of a new layer each year to its internal, the latter by the addition of the same to its external surface. Hence these plants have been called by Monsieur Decandolle exogenous, because the growth of their woody matter proceeds from within outwards.

In the monocotyledonous on the contrary there is no distinction of wood and bark, and the plant consists merely of fibrous bundles, which are dilated by the successive additions of new fibres proceeding from its cen-

tre. Hence, when the external portions can dilate no further, the new wood is forced upwards, and thus tends to increase the height of the tree. Such plants are called by Monsieur Decandolle endogenous.

The same difference applies likewise to the structure of the leaves. In dicotyledonous plants, the fibres, which constitute the ribs and nerves of that organ, are always disposed at a certain angle to the base of the leaf; whilst in monocotyledonous they are placed curvilinearly.

Thus we see, that the same marked difference runs through all the principal organs subservient to the nutritive functions, or to the mere existence of the plant; let us now inquire whether a corresponding difference may be traced in those concerned in reproduction, or necessary for the perpetuation of the species.

The number of the floral organs, or in other words of the stamens and pistils belonging to plants, seems at first sight to present every conceivable variety, and it is well known to every one, that Linnæus availed himself of this variety, as the foundation of his elegant artificial system. Nevertheless it is the opinion of Decandolle, an opinion which in the course of my Lectures I hope to be able to verify, that in the monocotyledonous division there is always a tendency to the number three, or to some multiple of that number, and in the dicotyledonous more generally to five, or a multiple of five.

Assuming this to be the case, it will follow, that, so far as we have yet gone, the classification adopted is a strictly natural one, as being confirmed by a consideration of either description of organs, whether of those subservient to nutrition, or to reproduction. It will also follow, that all the members, belonging to either of these great classes, are formed, as it were, upon a common type or model, and that the subordinate divisions into families must be deduced, from a consideration of the degree, in which each species deviates from this, the general standard.

In the dicotyledonous class, for example, we ought, if

our theory be correct, to find in the seed-vessels, the parts of the corolla, the parts of the calyx, the stamens, and perhaps the pistillum, the quinary arrangement prevail; and yet it would perhaps be impossible to point out a single plant, in which all these parts bear so exact a relation to that number, as to verify in every respect the correctness of the rule. Professor Decandolle has therefore endeavoured, with great ingenuity, to trace the causes which produce this appearance of irregularity, and by their more or less extensive influence upon plants, cause them to deviate in a greater or less degree from that common type, upon which he represents them to have all been formed.

A deviation from the original structure, he contends, may take place in one of three ways: either in consequence of some one of the organs of a plant dying away or becoming abortive; owing to its becoming altered in structure, and degenerating into an organ of a different kind, and discharging different functions; or lastly owing to its being united with another, so as to appear like a part of it.

These causes are ranked by M. Decandolle under the three general heads, of the abortion of organs, their degeneration, and their mutual adherence: and it is evident, that the effect of either of these causes might bring about such a change in the general appearance of a plant, as should render it altogether different from another, to which it would otherwise appear closely allied.

That particular organs in plants do frequently become abortive, in consequence of the common accidents of excessive or defective humidity, light, &c. and even by the particular position of the organ, will readily be allowed; but Monsieur Decandolle assigns a wider influence to this cause, contending, that in many cases there are forces in regular operation, which produce a constant alteration in, or obliteration of, particular parts. If indeed we admit, that such effects may arise from internal, as well as ex-

ternal causes, from the effect of the mere growth and development of parts connected with its own structure, as well as from the operation of foreign agents, it is plain, that they would extend, not to a few only, but to all the individuals, belonging to the family of plants, possessing the kind of structure which occasions it.

Thus, for example, we observe in the horse-chesnut three seed-vessels or carpels, each containing two seeds, whilst in the fruit we perceive in all never more than three seeds, and sometimes only a single one. It is evident therefore, that at least three of the seeds have died away, not from any cause which can be considered accidental, but from something inherent in the very structure of the tree. We may indeed trace the gradual decay of these abortive seeds, by opening the seed-vessel at different stages of its growth. In like manner it is found to be the rule, that in some cases the terminal, in others the lateral buds will arrive at maturity; but, that the abortion of the one arises merely from the development of the other, and not from any inherent peculiarity of structure in itself, has been proved, by removing the bud, which commonly expands, at an early stage, by which means the one which is commonly abortive is made to develope itself, and to arrive at maturity. The possibility of this occurrence cannot therefore be questioned, but to pronounce in what cases it has actually happened, becomes a question of great intricacy.

The first principle on which M. Decandolle proceeds, in order to determine what organs in a particular plant have become abortive, or are deficient, is by observing what are called the monstrosities to which the species is liable, or its occasional deviation from the accustomed standard.

These monstrosities arise in some cases from a return to the primitive type of the species, in consequence of the removal, by accident, of those forces, which usually modify its natural condition.

In the horse-chesnut, for example, the six embryos rarely ever grow to maturity, because those which first have acquired vitality, abstract nourishment from the rest, and thus cause them to die away.

It might happen, however, by some singular accident, that all the six embryos received the principle of life at one and the same instant of time, on which supposition the existence of six mature seeds in the two seed-vessels might occur—a monstrosity, which so far from being a further departure from the natural form, would be in fact a return to it.

The second method, by which the same point is determined, consists in examining the general analogy subsisting between the plant and others. If, for instance, all those species, which bear the nearest resemblance to the one we are examining, should have five stamens, whilst this possesses only four, we might reasonably conclude, knowing the great tendency of this organ to become abortive, that one habitually decays away owing to some cause incident to the nature of the vegetable.

The abortions, which take place, may occur, either from the plant being nourished in excess, or defectively. By an excess of nourishment the growth of the contiguous organs may be so accelerated, that the part itself is prevented growing, or becomes stunted; by defect of nourishment, on the contrary, the same consequence may directly ensue, and under either state of things one of two results will occur, either that the organ is so diminished, as to be incapable of performing its proper office, or that it is entirely obliterated. In the former case it often happens, by a beautiful provision of nature, that it is transformed into some other organ, and discharges certain other functions. Thus branches, petioles of leaves, petals of flowers, and other parts, degenerate, sometimes into thorns, and at other times into tendrils; thus the branches, becoming succulent, acquire the appearance, and perform the functions of leaves; thus, that which is essen-

tially nothing more than one of the envelopes of the kernel of the peach, becoming pulpy, is converted into a wholesome and delicate fruit.

The third cause of deviation from the accustomed standard, is the mutual adhesion of certain parts, a process similar to that which we produce artificially in the operation of grafting, and which often takes place also under natural circumstances.

It is therefore quite intelligible, that this same union of parts should be also produced in consequence of their natural proximity. Thus if two ovaries grow very near together, it is obvious, that they will have a tendency to unite into one organ. M. Decandolle therefore contends, that the corolla and calyx are in fact compound organs, made up of a certain number of petals, and of sepals, which have grown together: that a seed-vessel is a congeries of as many distinct organs, as it contains cells; and that every flower is a kind of commonwealth, being an assemblage of individuals clustered round a common centre, and more or less united into a common whole.

It would of course far exceed the limits of this Lecture, to enter into the proofs by which Mons. Decandolle establishes this doctrine; but it may not be amiss to append some general reflections upon it, and particularly to vindicate it from a charge which has most unjustly been brought against it, as having a tendency to exclude the idea of design in the structure of the vegetable world.

I must however be prepared to expect, from what I recollect to have myself felt, when the theory first became known to me, that many of you may view with suspicion a mode of explanation, in which the terms, abortive and degenerate organs, are habitually employed with reference to the works of nature; and I am disposed to regard the phraseology as an unfortunate one, which, so long as it be retained, requires to have its meaning interpreted, and which it might be better to discard, whenever one less liable to misconception can be substituted.

We are all indeed ready to admit, that an organ may become abortive in several of the individuals of a species, but we find it more difficult to reconcile ourselves to the idea of a part being defective, or continuing in a rudimentary state, throughout the species in general, its development constituting an exception, or a monstrosity.

Yet in what other light are we to consider, the mammæ of male animals in general; the stumps of wings, in birds, which, like the penguin, are unable to fly; the eyes covered with skin, belonging to the mole and the proteus anguinus; and the rudiments of toes concealed under the skin of ruminant animals?

And, if in the common course of nature, out of the many myriads of ova contained in the milt of a fish, a few only arrive at maturity; or if, as botanists believe, germs capable of being developed into shoots exist in every part of the tree, of which a small proportion only contribute to the growth of the plant, why should we feel a difficulty in admitting, that certain of the stamens, pistils, or other floral organs, become habitually abortive in certain species of plants?

It is a great mistake to consider such facts as these in any degree inconsistent with the existence of design, which is sufficiently substantiated, when it has been shewn that the whole proceeds on one consistent plan, and that plan a wise one, inasmuch as we discover no organ, which is not, in the great majority of cases in which it exists, seen to be subservient to some beneficial purpose. When however we endeavour to push the doctrine of final causes so far, as to imagine an use for every part, however minute, which exists in any particular species, we involve ourselves, I conceive, in unnecessary difficulties, and lay ourselves open to the cavils of the sceptic, when he succeeds in pointing out, that a part is either manifestly imperfect in its structure, apparently unadapted to the wants of the individual, or admitting of removal without detriment.

A better reply, as it seems to me, would be in the words of Pope,

——————— the universal Cause
Acts not by partial, but by general laws;

and that one of those general rules, which the Author of nature has thought fit to impose upon himself in all the arrangements of the universe, is to establish a certain analogy of form and structure throughout the families, which compose each of the great classes, into which organized bodies are divided, the several members of each of these classes bearing to those of another, a certain, although a more remote analogy.

As a consequence of this law, we find parts existing in a rudimentary or abortive state in one species, which in others serve some manifestly important office; neither would it be any objection to the idea of design, if it could be proved, that in this rudimentary condition they were absolutely useless, although it must be considered as an additional proof of arrangement, when, as in many instances, we are able to shew, that they become subservient to a new purpose, by being unfitted to their primary one.

Thus the parts of the calyx in many composite flowers degenerate into a pappus or down, which, being of a light and feathery texture, serves to waft the seeds attached to it to a great distance, and thus to disseminate the species; thus the nectaries, which are regarded as degenerated stamens, secrete honey, which attracts insects, by whose entrance into the flower the pollen is dispersed and lodged upon the pistils.

Perhaps, had not one of the seed-vessels of leguminous plants been constantly abortive, the seeds would have all been so stunted in their growth, as to have been unfitted for supplying nutriment to animals.

These, and other facts that might be alleged, prove, that the degeneration or abortion of particular organs often serves some wise purpose with reference to the plant itself, or to other beings; and that the same may

be the case in other instances, in which we do not perceive it, it would be presumptuous to deny.

Nevertheless it does not seem requisite for the argument as to final causes, to contend, that every organ must have a definite use in all the individuals in which it occurs, since its existence may be regarded, as being nothing more than a consequence of that general law of nature above stated, the wisdom of which there is no ground for impugning.

" If," says M. Decandolle, " on a subject so grave and so elevated, I may be permitted to avail myself of a comparison somewhat mean and trivial, I may perhaps render my views on this subject somewhat better understood.

" I will suppose that I am seated at a splendid banquet, and certainly the repast which nature sets before us may well merit this appellation.

" I endeavour to discover, what evidence can be afforded that this banquet is not the result of chance, but has been due to the will of an intelligent being. No doubt, I should remark, that each of the dishes is in itself well prepared, (this is the argument of the anatomist,) and that the selection of them implies a reference to the wants of the individuals who partake of it. This is the reasoning of the physiologist. But may I not likewise observe, that the dishes that constitute this repast are arranged in a certain symmetrical order, such as is agreeable to the eye, and plainly announces design and volition?

" Now, if on examining the above arrangement, I should find certain dishes repeated, as for instance in double rows, for no other apparent reason, than that the one might in a manner correspond to the other, or observe, that the places which they should occupy were filled with imitations of the real dishes, which seem of no use with reference to the object of the repast, ought I on that account to reject the idea of design?

"So far from this, I might infer from the very circumstances stated, an attention to symmetrical arrangement, and consequently the operation of intelligence.

"Now this is precisely what happens on the great scale in nature. Considerations derived from the symmetry of parts correct in great measure what is deficient in the theory of final causes, and tend, not only to resolve many difficulties, which present themselves in the general economy of nature, but even to transform them into evidences of the existence of this very order."

The subject however of abortive or rudimentary organs, whether existing in plants or animals, is one, which does not seem to be as yet satisfactorily discussed; and I trust that some one of the Bridgewater Treatises, to whose province such a subject more properly belongs, will be found to contain an explanation of them, which will render the above remarks unnecessary.

According then to the views, which I have just been attempting to establish, all organized beings, when compared one with another, present groups of greater or lesser extent, which themselves form parts of groups embracing a still wider range, and are divisible into others of a subordinate description. Each group is subject to two classes of laws, the first producing that regular order in which its organs are disposed, or in other words the symmetry of its organization, the second being the action of the processes of vitality, from which often result derangements in the symmetry of its parts, to such a degree, that their natural disposition is often completely disguised. This derangement of the normal structure may be ascribed, to the abortion of certain organs,—to their alteration in form and appearance,—and to adhesions between organs of the same or of different descriptions.

Now the art of classifying objects according to the natural system, consists in appreciating the influence of the circumstances, which tend to modify the structure in

each particular case, and abstracting them, so as to ascertain the true type, and character, of the group; just as the mineralogist seeks to discover the primitive form of a crystal, when masked by the changes occasioned in it, owing to the regular subtraction of its molecules, and other causes.

If I have succeeded in rendering my meaning intelligible, it will, I think, appear, that the putting into practice these rules affords no bad exercise of the mental powers, and will serve to establish the position with which I set out, that something more than mere tact and memory are requisite for an accomplished botanist. Indeed at Geneva, where this study constitutes a necessary part of every course of liberal education, we find it recommended on the score of its utility in disciplining the understanding, by the examples and applications it affords, of those strict and severe principles of reasoning which are unfolded to us by logicians.

Based indeed, as systematic botany now is, upon an insight into the structure and functions of plants; requiring for its due elucidation a continual reference to the principles of chemistry and of general physics; affording to the Divine some of the most beautiful illustrations of design with which nature can supply him, as well as of the most delicate subjects of inquiry connected with the doctrine of final causes; furnishing us, too, every day with fresh instruction in the materia medica, agriculture, and the arts of life; and with all this combining the strongest incentives, to healthful exercise of mind and body, and to frequent communings with the works of nature; botany is no ignoble or barren occupation, and may fairly lay claim to the countenance, not only of every medical establishment, but also of all bodies and societies of men, established for the advancement of general education.

For the pursuits of natural history, Oxford is indeed, in many respects, most favourably circumstanced; the noble library, over which my amiable predecessor in the chair I

occupy presided, a library, which he enriched with an almost unrivalled collection of works in all departments of modern scientific research, and of which he was himself so worthy a representative, in the stores of miscellaneous information which he had at his command, is in itself an advantage not lightly to be prized. The collection of minerals and of rock specimens, and the various contents of the Museum, so creditable to individual munificence, though hardly yet, it must be confessed, deserving of such an University as Oxford, furnish to the geologist and the zoologist the means of pursuing without impediment their respective studies.

The neighbourhood too, from the variety of different soils and substrata that occur within a short distance, affords a rich harvest of plants to the collector; and the convenient and useful Manual, lately published by my friend the Rev. R. Walker, renders their determination easy to those who examine them according to the Linnæan method.

The Physic Garden indeed, the most ancient establishment connected with natural history in Oxford, has hitherto fallen into bad repute, from the sorry and dilapidated condition of the houses, which its benefactors, a century back, at a time when horticulture was in its infancy, had provided for the reception of exotics.

Yet deficient as it is in many requisites, we must not forget the proofs of liberality extended to it, nor the facilities for the cultivation of botany, which even in its present condition it is in consequence enabled to afford.

Not to mention its founder Lord Danby, who left an estate at Kirkdale in Yorkshire, for the express purpose of maintaining it; and the society of Magdalen College, which for the last 200 years has almost gratuitously granted us possession of the ground, which constitutes its site; we owe to Consul Sherard the endowment of a professorship, and the gift of a valuable library, together with an Her-

barium, pronounced by Sir James Smith to be only inferior to that of Linnæus in botanical interest. My immediate predecessor has also contributed a handsome sum towards the erection of new buildings. But the greatest benefactor, which the establishment has had the good fortune to secure—though, so far as we ourselves are concerned, the fulfilment of his munificent intentions towards us has been postponed for an indefinite period, by the expense of the publication in which his executors, in compliance with his wishes, have engaged—is the late distinguished Professor, Dr. John Sibthorp.

It is to be regretted, that in his case the very splendid manner, in which he proposed to illustrate his favourite pursuit, should have circumscribed the utility of his undertaking, and in consequence his own merited reputation; for to this is to be ascribed the limited circulation of his Flora Græca, in which he has recorded the results of the elaborate researches on the natural productions of Greece and Turkey, to which he sacrificed his life, and of his truly classical attempts, to identify the existing species, with the names of those plants which are described by the writers of antiquity.

When the magnificent work alluded to shall have been completed, and the author's plans for the advancement of botany in this place are carried into full effect, by the foundation of a chair of rural economy, to be annexed to the botanical professorship, the united emoluments of the two will be sufficient to secure to Oxford the undivided services of a naturalist, who may be content to abandon, for the sake of science, the more substantial prospects of professional emolument—for to such persons has Dr. Sibthorp expressly limited his benefaction.

In the meantime let it be our endeavour to render the whole establishment more suitable to the improved prospects, which seem opening upon it; let us strive to render it, equally ornamental to the University, and conducive to the important ends for which it was instituted;

furnishing a cheerful and agreeable resort for the members of the University and City; and affording advantages, commensurate to the present improved condition, which this branch of natural history has attained. Let it at least be no longer proclaimed, that Oxford possesses at once the most ancient and the worst conditioned botanic garden in this country, and let us remove from the external face of the University the last remaining vestige of that indifference to scientific pursuits, which was but too plainly evinced only a few years ago, in the circumstance, that the body, whence in the seventeenth century proceeded a society, which became the parent of all the other institutions of the kind now existing in this country, and which also afforded it the first specimen of a Museum, and a Botanic Garden, should yet in the nineteenth century have been altogether destitute of the former, and have dropped so far behind most other universities, in all that is expected to be found amongst the contents of the two latter.

So far as the Botanic Garden is concerned, I flatter myself that the subscription set on foot will do much towards vindicating us from such an imputation, although I must not allow you to suppose, that, liberally as it has been supported, the sum that has been raised is adequate to effect the proposed objects, or even to supply all even of the more glaring deficiencies, that meet the eye in going over this establishment.

Were it to stop short at its present amount, the Committee might perhaps be blamed for having applied a portion of the money raised, towards the accomplishment of a design, which, though doubtless advantageous to the Garden, is of still greater moment to the Town in general; inasmuch as it will cause us to convert a plot of ground, which, from its being appropriated as a depot for stones, has hitherto detracted greatly from the general beauty of the approach from the London roads, into a pleasing and ornamental object.

In consenting to the sacrifice necessary for effecting this, the Committee were influenced by the expectation, that this very act would tend to induce members, both of the University and City, to cooperate towards this object in such a manner, that the Garden itself might not be impoverished.

In all such undertakings, however, as the present, an obstacle to their complete success exists, in the impression that has gone abroad respecting the wealth of the University itself, which prevents non-resident members from contributing, as they would otherwise do, towards an object, which they consider the public body itself so well able to provide for.

It is not difficult indeed to understand, how such a feeling has originated, when we consider the many handsome and imposing structures that meet the eye within the precincts of Oxford, all undoubtedly making parts of the same University, and therefore all equally interested in the maintenance and prosperity of the public establishments provided for their joint use.

Nevertheless it is needless in this place for me to prove, how erroneous such an impression is; how inadequate the funds of the University at present are to maintain their public establishments on a scale commensurate to the present advanced state of science; and how strong a call there is felt to be, for imposing a small rate upon the members who are enabled to reap the benefits of such Institutions, in order to supply the manifest deficiencies under which they labour.

I trust therefore, that such non-residents, as may feel an interest in the good cause, will be contented to infer, from the liberal subscriptions received from individuals belonging to most Colleges, that a disposition does exist generally in this place to give every reasonable encouragement to the study of Botany, and that this may suffice, until I can afford, as I trust may hereafter be the case, decisive proofs of the same feeling, in the contribu-

tions of a larger number of these bodies in their corporate capacity, than have as yet come forwards.

There is also, I fear, a feeling abroad, even in this place of learning, which opposes something more than a merely passive obstacle to such measures of improvement, as I have here been contemplating.

I know, it is imagined, by many very excellent persons, that too much importance is in the present day attached to Modern Sciences, under which comprehensive term, I apprehend, is meant to be included, the cultivation of natural history in all its departments, no less than that of experimental science. That this impression exists, is implied by the many vague insinuations thrown out, of dangers likely to accrue both to religion and to civil society from the prevalence of such a taste, and that too not unfrequently by men, who profess a keen relish for elegant literature, whose lives seem for the most part dedicated to the study of classical learning, and who do not fear to indulge the pride of intellect in disentangling the intricacies of pagan philosophy.

Now that in the world at large an increased interest is felt at present in the physical sciences, is a fact that cannot be doubted; and that this, like every other department of human knowledge, is liable to be abused, also does not admit of dispute. We ought therefore assuredly to feel grateful to those persons, who, in the honest and sober discharge of their functions as Christian ministers, undertake to point out to us the various rocks and quicksands to which we may be exposed, in that wide sea of scientific speculation, upon which so many venture.

But I fear, that in the tone assumed by some of these writers, may be detected a wish to represent the pursuit of physical truth, as pregnant with dangers from which other kinds of knowledge are exempt, and that the effect of such forebodings upon the minds of many may have been, not that of inducing them to take in more ballast,

and to provide themselves with better charts and instructions for the voyage, but to deter them from embarking in it altogether.

To counteract an impression, calculated to create the very evil which it deprecates, by alienating from science the class of persons whose influence would counteract this tendency, if any such were to be apprehended, I will just venture to suggest, that no kind of abuse has been yet pointed out as incident to science, to which all literary, all intellectual occupations are not equally exposed; and that I am quite at a loss to discover, either in the frame of mind which characterises the great body of its votaries at the present day, or in the temper and spirit of those societies and confederations which have been instituted of late to advance its interests, any thing that can justify the suspicions, which have from time to time been thus darkly insinuated.

Is vanity the besetting sin of men engaged in the study of nature and her phenomena?

There is certainly no kind of intellectual eminence which may not at times foster arrogance and self-conceit; but an inordinate appetite for display will surely find its cravings satisfied more readily, and be furnished with more highly seasoned food, amongst the flowery paths of literature, than in the less frequented regions of philosophy.

Amongst the sons of science, few received greater homage than did the distinguished President of the Royal Society lately deceased; yet even he, in the plenitude of his fame, was cast into the shade by the halo thrown around the head of a Scott and a Byron; to say nothing of the popular orators and statesmen of the day.

A Somerville, profound as her mathematical genius may be, could never be imagined to attain to the popular celebrity of a Corinne; and although we in Oxford may have rejoiced in the day, when an academic assembly conferred upon a botanist and a chemist those honours, which

evinced their warm sympathy in such pursuits, the time is yet far distant, when it shall be recorded of a man of science, as it has been of a popular poet in a neighbouring country, how, on his entrance into the national theatre, the whole audience greeted him with simultaneous peals of applause:

"Utque viro Phœbi chorus assurrexerit omnis."

If vanity then be the peculiar infirmity of men of science, it has chosen a field less calculated than many others to afford it indulgence, and, unlike other weeds, must thrive most luxuriantly where there is least to encourage its growth.

But, in point of fact, what is there in the general conduct of men engaged in physical investigations, to countenance such an imputation?

With some exceptions, no doubt, they are more apt to escape from the idle curiosity of uncongenial minds into comparative seclusion, than to court the applause of the multitude; and are indeed often accused of indifference, and a want of sympathy with the great mass of mankind, from the difficulty they feel in imparting a general interest to their pursuits, without frittering away their dignity.

Attention to physical science is also charged with alienating the mind from religion, though on what principle this should happen it is difficult to discover.

The sceptic may indeed find a pretext for cavil in the arrangements which it is the business of science to investigate, as well as in those which concern man as a social being; but to assert, that the study of the former has in itself any tendency to produce such a result, is a position, into which no judicious advocate would be betrayed, and which no real Christian could entertain.

Nor is there any thing in the character of men of science at the present day, which can give a colour to such accusations.

The living philosophers, of this country at least, are, as professor Sedgwick has observed [d], a set of sober-minded men, who have betrayed no hostility to revealed truth.

Even in geology, where the literal sense of Scripture, and the deductions of science, respecting certain physical phenomena have by injudicious advocates been sometimes brought into collision, men of science have shewn no disposition on their part, to avail themselves of this apparent discrepancy, as a weapon against revelation; whilst in other departments, there has been nothing, since the days of Galileo, to connect any class of persons dedicated to the study of nature, with discussions, in which the credit of sacred scripture is involved.

Granting, however, for the sake of argument, that science is beset with peculiar hazards, and that in the world at large it engrosses too large a share of attention, does it therefore follow that the Universities would act wisely in withholding on that account from it the share of encouragement, which they might otherwise regard as its due, or that a want of countenance on their part would have any appreciable influence, in remedying or even diminishing the evil?

Is it not rather to be feared, that such conduct may tend to alienate from our establishments, many of those who would otherwise resort to us, and be the means of transferring them to rival institutions, where such pursuits are cultivated?

Up to the present time, it has been the distinction of this country, that the education of the upper and middling classes of society has been almost exclusively confided to the clergy, a circumstance highly favourable, as I conceive, to the national character, so long as the Universities in which they are disciplined, and in consequence the ecclesiastical body itself, retain, as they in general

[d] See his Discourse on the Studies of the University.

have done, a tolerant spirit, and preserve a connexion and sympathy with all portions of the community, by receiving constant drafts, not only from the aristocracy, but likewise from every other class, down even to the humblest. But the maintenance of this privilege, one of such incalculable importance to the influence of the clergy in general, presupposes on their part the ability to train and prepare the minds of the youth intrusted to their care, in those branches of knowledge to which society attaches importance; a task indeed, for which the study of classical literature may have sufficiently qualified them, so long as poetry, the belles lettres, and the fine arts, continued the leading accomplishments of the educated classes.

But if at a time, when a taste for the physical sciences has obtained a hold upon the public mind, we should persist in turning our backs upon it here, and that at the very time when rival establishments have started into life, and are disputing our claims of *primogeniture*, the result will probably be, not to bring back the laity to the former objects of their homage, but to induce them to forsake our altars for those dedicated to a more congenial worship.

I fear you would accuse me of being imbued with the *esprit de métier*, if, though with the precedent of Upsal and Geneva in my favour, I were to advocate the introduction, of botany, or even of chemistry, and other branches of physical science, as necessary parts of an academical course; yet, considering how small a part of the circle of human knowledge is comprised in the studies made essential in this place, it does at least not seem unreasonable to expect, that some inducement should be held out to the student, in order that he may be led to acquire during his stay here, some one of those branches, either of modern literature, or of scientific knowledge, for which professorships are provided.

For such supplementary studies, the time spent at the University would for the most part furnish sufficient leisure, and the class of students who resort to the public lecture-rooms do, if I may judge from my own experience, actually consist in a great degree of the very persons, who afterwards are found to distinguish themselves in the examination-schools, whilst those of a different stamp, who resort to our colleges without any such views, are but rarely seen in them.

It is, by thus accommodating itself to the wants and exigencies of society, whilst it resists, so far as its power extends, hasty and violent innovations, that this University may hope to maintain itself, whatever changes await the state; respected alike during the ascendancy of popular notions of government, as it was formerly, by the arbitrary will of a despot; continuing to offer the shelter of its academic shades to a long series of future generations, as it has done to those of past ages; like some hardy and vigorous tree, which owns no natural limit to its existence, and is capable of becoming acclimatized in every region, and under every sky.

Of the fortunes indeed of the venerable and illustrious body to which I have the honour to belong, I see no reason to despair, if her sons will do their duty; on the contrary, I trust she will rise to still greater splendour and celebrity, in consequence of the necessity for increased exertion, which the existence of rival establishments must create.

Her prospects, however, mainly depend, upon her continuing, both in name and in substance, a national establishment [e]—the title, I trust, she will never voluntarily

[e] It has been suggested to me, that this sentence, coupled with the fact of my being one of the few persons who have not signified their approval of the declaration of the Oxford tutors relative to the admission of dissenters, may lead to an impression that I am myself favourable to their introduction into the colleges. I therefore deem it right to state, though aware

forego—it is her strength and her security—the reality will best be maintained, by her pre-eminence in all branches of liberal learning, and by the practical proofs she affords of the boasted excellence of her system.

These proofs will be supplied, by her evincing the suitableness of that course of mental discipline which she inculcates to forward the researches of science, as well as the pursuits of literature; to communicate a more liberal cast and a more philosophical bearing to the prevalent studies of the age; to direct the attention of their cultivators, more to the general principles and mutual relations of the several departments of natural philosophy, than to their minute details; by its tendency, in short, to send out in the world a class of men, with minds ripe for every kind

that the sentiments of a private individual, occupied chiefly in scientific pursuits, may be thought of little value, that the bill before the house respecting the admission of dissenters is understood to imply principles and to involve consequences, to the propriety of many of which I am far from acceding. I should at all times be opposed to the principle of any interference by legislative enactment with the discretionary power hitherto vested in the head or governor of each college to admit within his walls such persons as may seem to him fitting; and am more especially so in the present instance, when such interference would involve so essential a change in the course of instruction and discipline therein pursued, by the introduction of persons to whom both would be inapplicable; and when it would be likely to interrupt the harmony so desirable amongst the members of the same society, by bringing into close contact young men of such conflicting feelings and sentiments. I should regard it only a sort of one-sided justice, if parliament, in satisfying the claims of those who dissent from the establishment, were thus to overlook what was due to the interests of the still larger body who belong to it; and I should regard it no act of justice at all, but one of positive tyranny, if in exercising a control over the regulations of the general body of the university, it were to violate the rights and privileges of particular colleges, which derive their endowments from private benefactions, and are therefore only amenable to the legislature for the abuse of them. Thus far, I think, I can consistently object to the bill before parliament, without allowing my academical feelings to get the better of those principles of civil liberty, which I have ever maintained; and I apprehend, that such objections would have their weight with persons of every party in the house, whose views for the relief of the dissenters do not extend to the ultimate destruction of a national religion.

of inquiry, not prejudiced against those pursuits, which seem to be assuming every day in public estimation a higher and a higher importance, but qualified to take a leading part in them, and to communicate to them a direction favorable to the future well-being of mankind.

Oxford, March 14, 1834.

THE Committee who have undertaken to promote a Subscription for the general improvement of the Oxford Botanic Garden, and to superintend the expenditure of the money that may be raised, beg to invite the attention of the Public to a Report on its present condition, drawn up by the Professor of Botany, at the desire of the Visitors, the President and Fellows of the College of Physicians in London, and circulated generally amongst the Members of the University.

Considering that for nearly a century past no material additions have been made to the Buildings connected with this Endowment, and that its own funds are wholly inadequate to do more than to meet the current expenses, and to defray the ordinary repairs, of such an Establishment, they feel assured, that, at a time when the want of proper Houses for the reception of Exotics, as well as for the due preservation of the Collections, has become so manifest, an appeal may be confidently made to the University, the Colleges, and to individuals who wish well to the prosperity of our Institutions.

They trust, that, with their assistance, they may be enabled to make such arrangements, as shall effectually advance the interests of that important branch of Natural History which this Garden was intended to illustrate,

and reflect credit on the Academic Body for whose use it was designed.

The Committee consists of the following Gentlemen:

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Subscriptions for the Oxford Botanic Garden are received by Messrs. PARSONS and Co. Oxford, and by Messrs. HAMMERSLEY, Pall Mall, London.

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G. Thomson, Esq.	5	0	0
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Rev. Dr. Hoskyns	2	2	0
The President of Trinity	5	5	0
Rev. C. M. Nelson, Boddicott	2	2	0
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Rev. J. P. Lightfoot, Exeter	3	0	0
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Rev. W. Harding	1	1	0
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Rev. J. B. Maude, Queen's	2	0	0
W. C. Trevelyan, Esq. University	5	0	0
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Provost of Oriel	5	5	0
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Rev. J. Williams, Christ Church	2	0	0
Rev. J. Wilson, Trinity	2	2	0
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G. V. Cox, Esq.	1	1	0
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