Introductory.

Boston Oct.r 12 1810.

The course of Lectures, w.c we are now ab.t to give, commenced in the U. of Cambridge 3 & 20 years ago. As they owed their origin to the authority of the Univ.ty so have they been delivered, annually, under their patronage & control from the year 1788 to the year 1809.

The course was originally constructed with a view. The one was to illustrate the economy of Nature, as visible in the works of creation to several ~~important~~ purposes. Other was to give our young men some idea of the hitherto neglected subjects of Botany & Mineralogy; and also some notion of the general structure, & economy of animals; as well as an exposition of the great frame, or Temple of Nature, that is, within our view.

Another favourite idea of the Lecturer was, to excite and promote among our young gentlemen, a taste for the works of Nature; by constantly reminding them, that Nat.l History was the basis of all the Sciences.

We had moreover another ardent wish — to hold up such a view of the phenomena of Nature, as should excite a train of thinking, w.c should have a constant reference, & unavoidable tendency to recognize one Supreme Intelligent Author, — the Legislator, as well as the Creator of the Universe. We told them from high authority, that to make this the "ruling & habitual "sentiment of their minds, was to lay the foundation of all "that was valuable in morality & Religion: — for it made

this world a Temple, & life itself one continued act of adoration.

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We conceived all this might be done, by en-grafting knowledge upon curiosity, that natural shoot of a vigorous intellect. Curiosity, or a desire of knowledge, is the thirst of the soul; and is a pro-pensity that peculiarly characterizes the inhabi-tants of old England, & of new; and distinguishes them, remarkably, from the inhabitants of China, who lifted their languid eyelids, but for a moment to view, that perfection of human art, a Man of war.

Many have been the disputes respecting education; or the best method of cultivating the un-derstanding, of young people; but none have been found to produce such beneficial effects as properly exciting, or rather gratifying this thirst of the soul. This desire of knowledge ex-erts itself with remarkable efficacy in youth; for at that period, the mind seizes w.th peculiar avidity every object presented to it:- hence the importance, the great importance of presenting such objects to it, as while it engages the mind with pleasure it, at the same time, fills it with chaste and instructive ideas. And this is, if I mistake not, the very essence of a good education. —

Lord Kaims, when speaking on the subject of education, ~~says~~ laments the too general neglect of the study of the works of nature. He ∴ strongly recommends to young people, what he calls the Philosophy of Natural Hist.y — "As the productions of Nature are almost infinite, they should, says he, be treated in discourses, or lectures, in a general way, mixed with reasonings" — That is, the works of creation should be treated of in reference to their uses, their connexion, & relationship of one thing to another, and not a mere dry description. Lord Kaims conceives that Lectures upon such a plan would, by exciting a taste for the examination of the various objects of nature, generate a habit of observation; wc. says he, refines the feelings of young people. "Of Natural Hist.y in general, he observes, that it is a source of infinite amusement to young men; that it prevents idle & vicious propensities; and exalts the mind to the love of order, virtue, regularity & rational entertainment" — A mere narrative of detached facts; a concise & dry description of a plant, animal or mineral, ~~are such~~ is as tedious to the aspiring student as ~~they are~~ it is useless. It is the qualities & economy of the plant; the instincts, powers & faculties of the animal; and the virtues, & uses of the Mineral, that constitute that code of

knowledge so useful to every man, in his passage through life. Instead of therefore trammeling the mind, and cramping enquiry by attaching ourselves to artificial classifications, and systems, falsely so called; let us rather study the accordance, the relationship and conformity w.ch the different objects of nature bear to one another, & to ourselves.

The objects w.ch attract youthful attention and curiosity, most commonly are — the Earth on w.ch we live; — the beauteous carpet of vegetables that covers & adorns its surface; the unknowing boundless ocean; the Sun, moon & Stars; the regular succession of day & night, together with the agreeable & variegated vicissitude of the seasons. — These, taken collectively, form the most interesting and august scene this side of the eternal world!

When these objects are considered more minutely, (the Earth e.g.) we see rise out of it, the science of Mineralogy. From a general view of the beauteous carpet of vegetables, that covers & adorns the earth, we are led to consider an individual plant, its structure, oconomy & use, whence emerges Botany: When museing on the boundless ocean, we are naturally led to enquire after its innumerable inhabitants, and of the uses of this vast expanse of water, in

in the economy of the terraqueous globe. — And then, if we raise our eyes above the surface on w.c we tread, & contemplate the Sun, Moon, and Stars; and take in the whole Solar System, our minds may be so expanded, by the grandeur of the scene, as to enable us to attain a glance of that Almighty hand, w.c impels & controuls the whole!

These all various subjects compose, what is called, by a rhetorical figure of speech, the Great Volume of Nature. And it has been our constant endeavour, for more than 20 years past, to lead on the youth of our University to read this Great Book of Nature, by pointing out to them its first elements, or alphabet; and then shewing how to connect this alphabet into syllables; next instructing them how to put these syllables together, so as to enable them, as they run on through life, to read distinctly.

We have ∴ held up this Volume of Creation to the view of our pupils, as a portion of that sacred scripture, w.c is written by the finger of the Deity himself, upon every animal, every plant, and every mineral in creation. An uncorrupted scripture this; w.c if not a first, is a second revelation. —

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There is no study, in the whole circle of the Sciences, wch excites a more continued progression of pleasure, or that creates more real profit wn the study of Nat. History. As to its pleasure, it is certainly one of the most pleasing occupations that can exercise the rational mind: and it has this peculiar to it, that no frequency of contemplation, closeness of inspection, or keeness of investigation ever brings weariness or disgust. It is a pleasure differing from all others, from its bringing no satiety or disgust; for here gratification and appetite are perpetually interchanging

" There's not a tree,
" a plant, a leaf, a blossom, but contains
" a folio volume. We may read and read,
" and read again, and, still find something new,
" Something to please, & something to instruct" (Village curate

But we have never recommended Nat. History merely to please the mind, amuse the imagination, & gratify the fancy. We hold it up to your view as a study of the first importance to a country situated & circumstanced like ours, i.e. a country entirely commercial & agricultural. Dr Johnson, (having perhaps, the Chinese nation in his mind) says "By agriculture alone can we live in plenty without

intercourse

intercourse w.th other nations." But the Newlngland-
-man is as widely different in his feelings, habits
and views from the Chinese, as he is distant from
him, in his position on the globe. The Chinese
is like a plant, rooted to one spot; while the New-
-Englandman is like a web-footed bird of passage,
who flying high to distant regions of the globe, gains
his subsistence by the help of the air & the water.
— You cannot easily seperate the Chinese from the
clod on w.c he vegetates; nor the New.Engl. man
from the boundless ocean, by which he lives,
(moves) & has a superior being.

Disjointed as the world appears to be, by seas,
rivers & discordant nations & languages, yet the Com-
-mercial man binds the whole world together by a
golden chain. Nevertheless all depends on
Agriculture, w.c is therefore "the art, the great art, w.c
every government ought to encourage protect; every
proprietor of land to practise, & every inquirer into
Nature to improve". On this account, we have
thought it of importance to pay particular attention to
the structure, or anatomy of a plant; and of the laws
of its growth, as well as of the appropriate food of
such

Johnson.

such plants as are most in use for the sustenance of man; for without a knowledge of these principles, Agriculture, that useful, important & honorable profession must remain a vague & uncertain study. It will appear ∴ in the course of these Lectures that Nat. Hist.y is the very basis of Agriculture; and Agriculture is the sure & certain support of a Nation; for we are told by Tacitus that the Romans were several times reduced nearly to famine, by depending on Egypt, & Africa for Corn, instead of relying on the prolific vigor of their own Italian soil. And thus, says this celebrated historian, were the lives of the Roman people "committed to the caprice of the winds & waves." Every wise Legislator knows the dependance of a people on the success of Agriculture; and every student of nature knows the dependence of agriculture on a correct natural history.

The other source of comfort, wealth & power is Commerce w.c owes a portion of her greatness to Nat.l History. The oak of w.c the hull of a ship is constructed; the pine of w.c her mast is formed; the hemp her sails & cordage are made of, are all taken from the vegetable kingdom, and have, in a peculiar manner, passed the scrutiny of the most eminent Naturalists. Linnaeus in Sweden, Duhamel in

France, and Evlyn in England, have professedly discussed & scrutinized the materials of a ship. Linnæus, that Prince of Naturalists taught his countrymen the best method of preserving ship timber, and was honoured by his King as a public benefactor. As the structure of a ship is from the vegetable kingdom, so all her warlike stores are from the mineral. as she moves on the water, by the impulse of the air, so her motion, as well as her materials, come under the contemplation of the Natural Philosopher. To this we may add, that every cargo that arrives, & departs, is more or less an object for the Naturalist. — This is not all — the Ship is indebted to the Naturalist for the magnet, of which her compass in constructed; by means of which, she traverses the trackless ocean, in the darkest night, with perfect safety.

If Nat^l History has benefited Navigation, Commerce in its turn, has benefited Nat^l History; for it has made the whole world as one city, or immense family. — But why need I utter a word on the pleasures, or on the advantages of Nat^l Hist^y? To recommend this branch of science from motives of pleasure, or utility, were to affront the understandings of such an audience as this — I might as well labour to convince you of the blessings of health, or the advantages of sobriety. —

Juvenile ~~Natural~~ curiosity impels the active ~~juvenile~~ minds to this query—; from whence came those things which we see around us? — They did absurdedly not make themselves; Power & Knowledge meet us everywhere. What is the source of it? neither have they existed always. — To satisfy this natural query, we shall before we even enter the threshhold of the Temple of Nature discuss the subject of the Primary matter; or that original fund, w.c is constantly changing out of, and into all the various substances perceivable by the senses. We shall attempt to show that the production of a plant e.g. and every other organized body, (by w.c we mean every body capable of growing,) is not a fresh creation; or calling of something out of nothing; but a mutation, or change of something that before existed. — *

We shall next speak of the astonishing divisibility of simple matter, especially in animal bodies. — After showing you that matter cannot move itself, we shall speak of that original power, w.c causes weight, and that w.c causes heat; or, in other words, of gravitation, & of fire: the one operating from the circumference to the centre, causing weight; & the other expanding from the centre to the circumference producing heat. We shall endeavour to shew you how these ballance each other; and that from a combination, and modification of these two opposite powers, result the most striking phænomena of the Universe.

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* This mutation is something more, & beyond what the chemists call decomposition.

We shall endeavour to show you that "of all the powers in Nature, heat is the chief." We shall then give you the opinions of Thales who taught that water was the element out of which all things were made; and of Heraclitus, who taught that fire was that out of which they were all created; and of Anaximenes, who contended that air was the origin of all things, seeing that the other two could not exist without it.

Then we shall speak of Light; and shall attempt to shew that organization, growth, sensation, & spontaneous motion exist only in places exposed to the influence of light. — When discussing this subject, you will cease to wonder, that some Nations, not blessed with revelation, have worshiped the Sun as a God. "the Prime Cheerer" "the eye & soul of this lower world."

This will lead us to speak of the grand Efficient cause, or that spirit, or principle of motion, w.c throws into shape, & actuates the otherwise life-less matter. And this may possibly lead us to speak of that abstruse subject animal life. We shall endeavour to make it appear that the animal is impelled & sustained by ~~the same~~ similar laws with ~~as~~ the vegetable; only he rises much higher in the scale of vitality.

We shall next speak of the almost imperceptible transition from inert to organized matter, & trace the principle of vitality from a vegetable to the lowest order of animated nature, or the Zoophytes, or that order of beings w. forms that link in the chain that connects insensible to animated nature.

As every animal in nature comes from an egg, so every vegetable springs from a seed. This will lead us to give you a minute description of a seed, as it appears through the microscope. We shall find on inspection that a seed is a regularly organized body, furnished with different orders of vessels, like an animal. Nay farther, we shall find that a seed is a system, (i.e, a complete whole, wrought up into a narrow compass, and retaining a living principle, capable of being expanded by a due degree of warmth into a Tree.) This train of investigation will naturally lead us to the beautiful subject of Botany, the leading principles of which we shall explain as far as this unpropitious season will admit.* in a manner adapted to a mixed audience.

From Botany to Agriculture is a natural and easy transition, when we shall discuss the principles of agriculture & vegetation — We

*Last week in Dec.r 26th 1810.

We shall speak of the advantages of labour, w.c we consider as a task kindly imposed on man by a beneficent Creator, as the best means of preserving his health, his safety & his innocence. — In this part of our course we shall attempt to trace that unceasing rotation between the growth, & decay of vegetables, & the vitality of animals; by which circulation life is kept up, without a pause, throughout every part of the creation: and this discussion will carry us up to the Animal Kingdom. Here we shall be led to enquire whether Plants & animals actually divide themselves into two distinct Kingdoms; or form only one immense family?

As in the descending scale of nature, Quad-rupeds (so denominated) follow after man, so Birds follow after quadrupeds; this leads us to consider that beautiful class of beings. This charming race of animals enliven our forests, amuse our walks, & excludes solitude from our most shady retirements. This is a delightful part of natural history; for birds enliven the general picture of nature, & give harmony to meditation.

We shall pass over the subject of Amphibiology, & Ichthyology in a cursory manner, that we may come to the subject of

Insects, wc is one of the most enchanting subjects of Natural History. They are so unlike any other department of nature, that they form a little world by themselves. It is one among the glories of modern times, to have invented optical instruments, by wc we can discover objects imperceptible to the naked eye. The microscope operates like an enchantment, by calling up to view the invisible world. a world of wonders totally unknown to the ancients! —

In this part of our course, we shall speak of the Scale of Beings; wc rises, by insensible degrees, from the most senseless being up to the brightest genius of the human kind. The general graduation of this scale will be found to be thus: — 1st inorganized beings, as a stone; 2d organized & inanimate beings as a plant; 3. organized & animated beings, as the brute animal, and 4th organized, animate & rational beings, of wc there is but one on earth, viz MAN. This scale is again subdivided thus: — the animal produced by a cutting, as in the Polypus, is but one degree above the vegetable, that —

4 grand Divisions.

that produced from an egg is one step higher;—that class of animals w.c is produced alive, is still more exalted;—of these such as produce one at a time, is the most complete; the foremost of w.c stands the great master of them all Man. It is in this part of our course that Man will offer himself to our view. Man is placed on the very top of the visible scale of creation. I say of the visible scale, or series of creation; for we do not believe that the scale of Beings ends, were it ceases to be visible; but that it passes on through other worlds, and through a countless series of beings up to the footstep of the throne of the Deity! [In all this discussion it is not to be supposed that we shall glance at any thing improper for such a mixed audience as this.]

In a philosophical view of the human person we shall perceive that Man is the master piece of creation, that he unites in himself almost all the powers and faculties of nature.

In this part of our course, we shall be led to speak of that innate power w.c conducts man, in his gradual growth, from helpless infancy to full maturity; a power that nourishes, refreshes & animates him; it is a power by w.h we sleep, or walk; but this power he has in common with brute animals: it is as perfect in the horse, or the dog as in man: for in man is found something of a very different nature

nature, viz a power of thinking, reflecting, comparing, and representing to itself past, present, & to come; which power is termed mind — comprehension — understanding, reason, will, freedom, or collectively by the single word Soul. Here we shall probably venture to speak of his Intellectual Powers discuss the nice subject of the gradations of the human species; and compare the mental powers of the European, the Asiatic, the Asiatic Turk and the Negro. Here will be the place to enquire whether the difference in the minds of men be so much the effect of education as organization? —

In the course of our enquiry, we shall find, that Man, of all earthly beings, alone possesses the power of contemplation. He, alone, is capable of surveying the universe, & of elevating his mind to the Almighty hand that directs the whole! — this we shall attempt to exemplify in a View of the Solar System. This we shall describe. — Then we shall retire to one of the smaller bodies circulating in this system, viz the Terraqueous Globe w. we inhabit, The only Observatory allowed to mortals, this side of the Eternal world! We shall find the Solar System, as like its Great author, perfect; because no subordinate being could correct any defects; or alter it for the better. But we shall not find our Earth to be

perfect

perfect; but capable of being mended, & made better. this mending the earth, & making it better is the Noble Art of Agriculture, whence emerges Commerce with its long train of benefits & comfortable consequences. Here we shall treat of the formation & use of mountains, & the origin of rivers; ~~and of the contents of the Earth~~ and of that perpetual circulation of fresh water, drawn by the distillation of nature from the salt ocean, through the atmosphere, down the mountains, and, in the form of rivers, to the Ocean again; by w.c neverceasing circulation, animal and vegetable life is continued (on) without a pause, throughout every part of this lower world.

[Theories of the Earth - Mineralogy - Water - & of that secret world of wonder the atmosphere]

Here we shall endeavour to shew the connexion & dependence that one part of Nature has with another, w.c appears, at first view, to have no relationship at all, with each other - as between the Ocean & vegetation; & between the atmosphere that surrounds the earth, & the water in the bowels of it.

In reviewing, or summing up this part of our course, we shall perceive that every thing in these great outlines of the Universe is systematical: all is combination, affinity & connection. The Sun gravitates on the planets; the planets on the sun, and on each other.

These taken

—: These taken together gravitate on their neighbouring systems;- these again on more distant ones, while the ballance of the Universe remains in equilibrio in the hands of the Creator & Legislator of all things!

Before we close, we shall speak of the art of reading the "great Volume of Creation"; and shall give you a specimen of that "language, w.c (as Lord Bacon says) "gone out to all the ends of the earth, unaffected by the confusion of Babel." We shall attempt to shew you that the material world is a mirror reflecting moral truths, where we shall

——" See Books in the running Brooks,
" Sermons in stones, & good in everything"

And lastly we shall combat that atheis-tical philosophy, w.c arose before the period of christianity, and having slept for ages, revived again, in our our days, in France. We hope to shew that after all the violent struggles of a proud & reluctant philoso-phy, "the necessary, the unavoidable resort is to a "Deity." We presume that we shall, ~~[illegible]~~, from the few extracts that we shall have given you from the Volume of Nature, be able to point out such marks of design as are too strong to be got over. This design must have a Designer. We shall oppose with all our might that ~~blind~~ blind system of phi-
losophy

philosophy w.c supposes a mass of matter regularly moved, without a mover; bestowing intelligence upon itself in a man;-and withholding it in a stone; establishing relations & connections through the whole of its works without any end or design! labouring blindly with the most consummate regularity, and sublime industry!"

Voltaire

Having told you what we shall do; it only remains for us to say what we shall not do. In the 1.st place we shall not attempt to play the orator, & that for several reasons, 1.st because the manner of treating our subjects admits not ~~excludes~~ passionate expressions & oratorical flourishes; and 2.ndly if it did, we are conscious that we should not succeed. Plain description, & simplicity of language is all we aim at; and perspicuity, we shall always place before ornament. We have, in this country, deviated from, without improving on the diction of our fathers. By partially imitating the vague pronounciation of that country, whence we originally sprang, we are, I fear, in danger of in=juring our own; w.c certainly, was once natural & manly. This propensity of imitating our transatlantic brethren, has been carried of late years, to such a degree of fastidious nicety, that people seem afraid to trust themselves to their own natural tone of voice. —

We shall try to avoid these snares of the understanding; and shall endeavor to express what we wish to convey, in so plain & simple a stile, as to require no other preparation yn common sense, & an unprejudiced mind.

∵ ~~nor~~ however.

∴ therefore