appendix to Lect. 3d. Cambridge Nov. 19th. 1787.

"Matter is that Elementary Constituent in composite substances, wc. ap-
"pertains in Common to them all, without distinguishing them from one
"another."

Every thing generated or made, whether by nature or art, is generated or made out of something else; & this something else is called its subject or matter. Such is Iron to the Saw; such is Timber to the House.

Now this subject or Matter of a thing being necessarily previous to that things existence, is necessarily different from it, & not the same. Thus Iron, as Iron is not a Saw; and timber, as Timber not a house; yet Iron is the subject or matter of a Saw, because thô not a Saw, it may still become a Saw. (E. cont) Timber is not the subject matter of a Saw, because it not only (as timber) is no Saw, but can never be made one from its very nature & properties — "Hence then one leading character
"of matter is that of Aptitude, or Capacity."

There can be no change of one thing into another, where the two changing Beings do not participate the same matter. e.g. a Saw may be changed into a Chisel; & a Chest into a Table, but not into a Saw. — But were this wood to moulder & turn to Earth, & that Earth by a natural process under ground to metallize & become Iron, thro' such a progression indeed as this, we might suppose even this Table to become a Saw. "Hence ∴ it is, that all change is by immediate
"or mediate participation of the same matter."

This we have chosen to illustrate from works of Art, as falling more easily under human observation. 'Tis however no less certain as to the productions of Nature, thô the superior subtilty in these renders examples more difficult.

The Question

The Question then is, "whether in the world w.c we inhabit, it be not ad=
=mitted from Experience, as well as from the Confession Sentiments of all Philo=
=sophers, that substances of every kind, whether natural, or artificial,
either immediately, or mediately pass one into another;" — that re=
=ciprocal Deaths, Dissolutions & Digestions, support by turns all sub=
=stances out of each other, so that as Hamlet says, from an idea of this
perpetual change & rotation,

Imperial Cæsar, dead & turn'd to clay,
May stop a hole, to keep the winds away!

The Question in short is, — whether in this world w.c we inhabit, there
be not an universal change, or mutation of all things into all.e —
If there be, then must there be some ONE Primary Matter common
to all things; — I say some ONE primary matter, & that Common to
all things, since without some such matter, such mutation would
be wholly impossible.

Privation & Capacity are essential to this changeable substance,
For had this Primary matter in its proper nature any one particular
attribute, so as to prevent its privation from being unlimited & uni=
=versal, such attribute would run thro' all things, & be conspicuous in all.
2. & if it were white all things w.d be white; if circular they w.d be
circular; w.c is contrary to fact.

Here then you have (a faint) idea perhaps of that singular
Being (ΥΛΗ ΠΡΩΤΗ) the Primary Matter, a Being w.c flies the
Perception of every Sense, & w.c is at best even to the Intellect, but
a negative object, no otherwise comprehensible y.n either by
Analogy or Abstraction. For we never see matter in its primary form, but always wrought into something else

We gain a glimpse of it by Abstraction w.n we say that the
First matter is not the Lineaments & Complexion w.c make the beauti=
=ful

=ful face; nor yet the flesh & blood, w.c make those Lineaments, & that complexion; nor yet the liquid & solid Aliments w.c make that Flesh & Blood; nor yet the simple bodies of Earth & Water, which make those various Aliments, but Something, w.c being below all these, & supporting them all, is yet different from them all, and essential to their existence

We obtain a sight of it by Analogy, when we say, that as is the Brass to the Statue, the Marble to the Pillar, the Timber to the Ship, or any other secondary matter to any peculiar form, so is the First & Original matter to "all the various bodies "in the Universe".

The Doctrine we have here endeavoured to inculcate was expressed by the Antients under the Fable of Proteus.

ad pag. 81 Ch. IV.

~~You will find this Doctrine~~

We have said that Privation & Capacity were the two first essentials w.c you ought to consider in matter.

E.g. here are two perfectly white powders w.c I shall change into another substance, but before they be changed into a third body they must first be deprived of the more evident one viz. Colour — and then they capacity of taking another colour — by heat it becomes red & quicksilver makes it appearance —

E.g. Here are two fluid, one amber colour the other colourless. I mix them & see it is white — by a 2. mixture I restore the colour & from a fluid see a substance

This Iron key I turn to Copper — The Alkanists from this idea tried to change E. Silver into ☉. On this doctrine of mutation the Alkanists build their hopes.

Lecture 4th

In our last Lecture we spoke of original, or primary matter, out of w.c all things were created. ~~we said, that~~ this primary or unwrought matter we could have no perfect idea of; because every thing we see in ~~Creation~~ the Universe is wrought, or worked up into some substance, w.c from some known pro:-perty or quality is distinguished by some particular name, for the original matter we talked about, was as the Scripture says, "without "Form, & void". It has neither colour, weight, shape, nor any one quality which we are habituated to observe in all those various objects around us

We presume then, that the first act of Omnipotence was to give this first & simplest matter a form, by w.c it may be distinguished from any other. We said if you remember that

"Matter was that Elementary Constituent in composite substances "w.c appertains in Common to them all, without distinguishing them "from one another!" — whereas,

Consult Lock on forms & Essences see also Harris Hermes, where you will see that these are intelligible forms w.c are + subsequent to the sensible

"Form or Essence is that Elementary Constituent in every composite substance, by w. "it is Distinguished & Characterized, & known from every other."

(E.g.) The first & most simple of all Extensions is a Line. This when it exists united w.th a second Extension, makes a Superficies; and these two, existing together w.th a third, make a Solid. Now a Solid & com:-plete Extension we call the first & simplest Form; & when this first & simplest Form accedes to the first & simplest Matter, the union of the two produces Body, w.c is for that reason defined Matter triply extended. — And thus you see the rise of pure, and original Body. —

But even under this character, it is scarcely to be made an Object for scientific Contemplation. Tis necessary to this end, that its Extension sh.d be bounded; for as yet we have treated it without such regard. Now the

+ See Chap IV. Book III

the bound or limit of Simple Body is Figure, w^c is the next form after Extension.

In Body thus boundedly Figure, every other of it's attributes, being abstracted & withdrawn, we behold that species of Body, called Body Mathematical; a name so given it, because the Mathematician, as such, considers no other attributes of Body, except it be those two Primary, it's Extension & it's Figure.

and we may see the reason why Mathematical Contemplation is so accurate and certain: It is because of all Bodies, mathematical body has the fewest, the most obvious, & the most precise attributes. Hence we see the difference between the Mathematician & the Nat^l Philosopher, the subject of the first is simple; of the last complicated

But tho' bounding of Body by Figure is one step towards rendering it more definite & knowable, yet is this not sufficient for the purposes of Nature, (or for the Nat^l Historian) 'Tis necessary here, that not only its External should be duly bounded, but that a suitable regard should be likewise had to it's Internal.

This Internal Adjustment, Disposition, or Arrangement, (~~called~~ denominate which you will) is called organization, & may be considered as the third form w^c appertains to Body. By it's accession we behold the rise of Body Physical or Natural, for every physical, or natural body, is someway or other organized.

And thus we may affirm that these three, that is to say, Extension, Figure, & Organization, are the three original Forms to Body Physical, or Natural; Figure having respect to its External; organization to it's Internal; and Extension being common to both to one & to the other.

It is more y^n probable, that from the Variation in these Universal, & as I may say, Primary Forms, arise most of those secondary Forms usually called

Sensil

sensible Qualities, because they are the proper Objects of our several (Senses) Sensations. Such are roughness & smoothness, Hardness & Softness, the tribes of Colours, Tastes, & odours, as well as those powers of Cha:=racter more subtile, viz the Powers Electric, Magnetic, Medicinal &c

No where perhaps is the force of Organization more conspicious yn when we perceive different Grafts, upon the same Tree, to produce different Species of Fruit. ad. p. 89 —

We have ~~more yn once~~ and mentioned that we believed that the Fables to be found in the antient Poets were all founded on Nature & pregnant wth Wisdom. — The Antients re:=presented the primary matter we have been speaking of, under the character of Proteus; and Providence or the Effecient cause that wch modified ~~and~~ formed & gave a character to any production, was called Eidothea wch was said to be the Daughter of Proteus. It is said of the old fable Proteus that he had his Herd of Seals, or Sea:=Calves; that "'twas his custom" to tell these over every day, & then re:=tire into a Cavern, & repose himself. Of this Lord Verulam gives the following Explanation: —— that under the Person of Proteus is signified matter, the most ancient of all things next to the Deity — that the Herd of Proteus was nothing else than the ordinary Species of Animals, Plants & Metals, into which Matter appears to diffuse, & as it were consume itself; so that after it has formed & finished those several Species (its task being in a manner complete) it appears to sleep & be at rest, nor to labour at, attempt, or pre:=pare any Species further.

Virgil referred to this Philosophy when he says of Proteus.

"omnia transformat sese in miracula rerum.

"Ignemque, horribilemque feram, fluviumq. liquentem" Geo IV.

and Homer — that he "He became each living thing that creeps on Earth;

"will glide a liquid stream, or blaze a flaming fire".

Eustathius, one of Homer's Commentators, says on this passage, that it means Proteus, or original matter wch is the Receptacle of Forms, that wch being in Actuality no one of these forms, is yet in Capacity all of them. and that Eidothea his Daughter is the Principle of Motion, wch moves, & actuates & throws into form what was inactive and formless.

Now, it is ~~evident~~, not easy to conceive in thought, or to express in words, the real subtilty of nature, without the supposition of Atoms. Sr. Isaac Newton thinks it highly probable that God in the beginning formed matter, into solid, masy, impenetrable, moveable particles, or atoms; of such sizes, & figures, & wth such other properties, & in such proportion to space, as most conduced to the end for wc he formed them: and that these primitive particles, being solids, are incomparably harder yn any porous bodies compounded of them; even so hard as never to wear away, or break in pieces;- No ordinary power being able to divide, what God himself made one in the first Creation.

While the particles continue entire they may compose bodies of one & the same nature & texture in all ages; but sh. they ~~wear away~~ move away, the nature of things, depending on them may be changed. And ∴ that nature may be lasting, the changes of corporeal things, are to be placed in the various seperations, modifications, & new associations of these permanent particles in the creation; For, tis evident that all things change; and that nothing is lost; that the sum total of matter remains perfectly the same.

Here a speculation of another kind opens upon us, namely, to enquire into the moving principle wc the Poets call Eidothea in matter, or its Efficient Cause, that is to say, that cause wc associates those Elements, and which employs them, when associated, according to their various, & peculiar characters. The cause of motion is not in matter. It receives & communicates the motion, but does not produce it.

Now,

Now, the animating principle, or form, of a Natural body, is neither its organization, nor its figure, nor any other of those inferior qualities or forms, wc make up the system of its visible qualities; but tis the Power, wc not being that organization, nor that figure, nor those qualities, is yet able to produce, to preserve, & to employ them — 'Tis therefore the power, wc first moves, & then conducts that latent process, by wc the Acorn becomes an Oak; the Embryo becomes a Man. 'Tis the power by wc the Aliment of plants & Animals is digested, & by such digestion, transformed into a part of themselves. 'Tis the power as oft as the body is either mutilated, or sick, that co-operates with the medicine in effecting the cure. 'Tis the power, wc departing the body ceases to live, & the members soon pass into putrefaction and decay.' †

And further still — as putrefaction & decay necessarily wee come, & Nature wd be at an end, were she not maintained by a supply; it is therefore, the power, that enables every Being to produce another like itself; the Lion to produce a Lion, the Oak to produce an Oak; — so that while Individuals perish the species still remains. "At genus immortale manet". Virg. Geor. IV.

† Tis: the power — which Lives thro' all life, extends thro' all extent,
Spreads undivided, operates, unspent. — (Pope.)

But what is that power? Consult the Stoics. Some moderns say it is electricity