[[1]SIRIS

A CHAIN OF]

PHILOSOPHICAL REFLEXIONS AND INQUIRIES

CONCERNING

THE VIRTUES OF TAR-WATER

AND DIVERS OTHER SUBJECTS CONNECTED TOGETHER

AND ARISING ONE FROM ANOTHER

As we have opportunity, let us do good unto all men.—GAL. vi. 10.
Hoc opus, hoc studium, parvi properemus et ampli.—HOR.

First published in 1744

[1] The words within brackets were added in the second edition.

EDITOR'S PREFACE TO SIRIS

SIRIS—Berkeley's 'Chain of philosophical reflexions and inquiries'—presents his metaphysical philosophy in its latest form, as it was when he was about sixty years of age. More than thirty years had then elapsed since he had evolved the meaning of the words Reality and Externality, in the *Principles of Human Knowledge*; and more than twenty since he had unfolded, in the *De Motu*, thoughts about Causation, which suggest the Chain that here connects the supposed medicinal virtues of Tar-water with Omnipotent Intelligence immanent in the universe. In the interval, more than ten years before the date of *Siris*, he had defended his early philosophy, in defending his theory of Vision; and he had in *Alciphron* applied the same philosophy in vindication of Christian theism. Now, in 1744, his philosophy, developed and enriched by much reading and meditation, is made to crown a philanthropic treatise in medical metaphysics. It was printed in Dublin, and reprinted in London, 'for W. Innys and C. Hitch, in Paternoster Row, and C. Davis in Holbourn. Price two shillings.'

Siris, regarded as a philosophical essay, is the consummation, on the basis of Ancient Philosophy, of Berkeley's conception of the concrete universe, past, present, and future, as in necessary dependence upon all-constitutive Intelligence. Its 'chain of philosophical reflexions and inquiries' is the most curious and profound of Berkeley's

works. The scanty metaphysical literature of these islands in the last century contains no other book so remarkable; although it has been overlooked even by those learned in the history and bibliography of philosophy. Every time we open its pages we find fresh seeds of thought. There is the unexpectedness of genius in its whole movement. It breathes the spirit of Plato and the Neoplatonists in the least Platonic generation of English history since the revival of letters, and it extracts this Platonic spirit from a thing of sense so commonplace as tar. It connects tar with the highest thoughts about things, by links which involve botanical, chemical, physiological, and metaphysical speculations that are subtle and mystical. Its immediate aim is to confirm the benevolent conjecture, that tar may be made to yield a 'water of health,' fitted to remove, or at least mitigate, all the diseases of the human organism in this mortal state, and to carry fresh supplies of the very essence of life into the whole animal creation. Its successive links of ascending science are connected, by a gradual evolution, first, with ancient and modern literature concerning Fire; and, next, with the meditations of the greatest of the ancients, about the substantial and causal dependence of the universe upon active Mind. In one view *Siris* may be looked at as a classic Commonplace Book, into which the fruits of the learned meditation of Berkeley's life, regarding the universe in which we find ourselves, and the universal omnipresent Power, were gathered, and in which, with eloquent reiteration, they are expressed in a contemplative rather than in an argumentative form. It is a chain of aphorisms, in which the connexion is produced by quaint and subtle associations. Speculations of thinkers, ancient and modern, blend themselves with the links, and the whole forms a series of studies, as well in science of nature as in Greek and Eastern theosophy and metaphysics.

When we pass into *Siris* from the book of *Principles*, in which, more than thirty years before, Berkeley had reasoned out, with an enthusiasm more subdued in his advanced age, his new conception of external nature, we are transported from Locke to Plato, and find revived the ancient conception of gradation in existence, and of the constant animation of the universe. We exchange the young Dublin enthusiast, joyfully awakened to a great discovery, which was for ever to dispel empty abstractions in the light of concrete realities, for the companion of ancient sages, who had been taught by experience that one 'who would make a real progress in knowledge, must dedicate his age as well as youth, the later growth as well as the first fruits, at the altar of truth;' and who had gradually learned that 'through the dusk of our gross atmosphere,' in this life of sense, 'the sharpest eye cannot see clearly.'

This modification of philosophic thought and tone, as well as the singular occasion of its manifestation in a medical tract on tar-water, are explained when we review the circumstances in which *Siris* was composed. During the sixteen years which preceded its publication, Berkeley had lived much alone, among his books, first in Rhode Island, and afterwards in his secluded diocese of Cloyne; for the most part in indifferent health. Books, especially Plato and the Neoplatonists, became his favourite companions; while out of doors, among the poor of his diocese, he was, in the early years of his residence, as we gather from his correspondence, surrounded in an unusual degree by suffering and disease. We find him in every period of his life fond of natural science, and apt to yield to uncommon trains of thought which physical facts were apt to raise in his mind. In his 'remote corner' at Cloyne, the sufferings of his neighbours suggested the remedy of tar-water, of which he had heard much in Rhode Island, and which, when tried in different diseases, seemed to

grow under his hand into a Universal Medicine. 'I do not,' he modestly conjectures[1], 'I do not say that it is a Panacea; I only suspect it to be so: time and trial will shew.'

The mere suspicion of a discovery so wonderful, sustained by alleged facts and by ingenious speculation in the 119 opening sections of *Siris*, was enough to set Berkeley's thoughts a-going about the Ultimate Cause of tar-water being a cure for all corporeal ills in this prison of the body. Tar, to begin with, is drawn from the vegetable world, in modes which he describes (sect. 10–28). This leads to an inquiry into Vegetable Life; especially in organisms, such as pines, from which tar is readily produced (sect. 29–38). So we are, in the opening part of *Siris*, conducted through regions of vegetable physiology and botany, in company with Theophrastus and Pliny, Jonstonus, John Evelyn, and that 'curious anatomist of plants,' Dr. Nehemiah Grew. Firs and pines, we are told, secrete an alimentary juice, which consists of oily, aqueous, and saline particles. This, 'by the economy of the plant, and the action of the sun, is strained and concocted into an inspissated oil or balsam'; this oil being in those trees unusually abundant; also tenacious of 'acid spirit or vegetable soul': therefore when exalted and enriched by the solar action, it is found to be charged with 'a most noble medicine, the last and best product of a tree perfectly maturated by time and sun' (sect. 38). Cures, in an immense variety of diseases, are accordingly attributed to this acid, when it has been drawn from tar by the menstruum of water (sect. 2–7, 60–119).

Meditation upon the 'acid spirit or vegetable soul,' 'sheathed in its thin volatile oil,' and readily withdrawn from tar by water, opens the way to more general questions about acids and volatile salts. We are thus carried on

[1] *First Letter to Thomas Prior, on the Virtues of Tar-water.* Sect. 22.

(sect. 120) to chemical phenomena and their laws, and are led in the following sections to speculate in Chemistry. Appeals are made to Newton, Boerhaave, Homberg, and Boyle, the chief authorities on acids, alkalis, and salts (sect. 126–136). Some curious, old-fashioned chemistry, derived from Homberg, is served up in this part of *Siris*.

As 'the acid spirit or salt, that mighty instrument in the hand of nature,' is supposed to reside in Air, and to be diffused through that element, the train of thought is next directed to the atmosphere (sect. 137–151)—'the receptacle as well as source of all sublunary forms'—'the common seminary of all vivifying principles.' Air is assumed, according to an ancient opinion, to be 'a collection or treasury of active principles, through which a latent vivifying spirit is diffused'; the unique ingredient on which life immediately depends. Its heterogeneous elements are, it is alleged, united under a subtle sort of Fire, Light, or Æther, the Vital Spirit of the Universe, with which the Acid extracted by water from tar is charged.

We pass, accordingly (sect. 152) from crude chemistry of Air to physical and metaphysical speculation about this invisible Fire; the vital spirit of the sensible world; the principle which corresponds in Nature, the *Macrocosm*, to the animal spirit in Man, the *microcosm* (sect. 152–165). The ancient biological conception of the universe, with its universal soul (*anima mundi*), is accommodated to this fire-philosophy, and contrasted with the lifeless, mechanical science against which Berkeley everywhere protests. His curious learning is employed (sect. 166–205) in defending a science of Vitalized Fire. Some of the highest authorities are adduced: Heraclitus (its chief source in Greece), Plato, the Peripatetics, Theophrastus, the Stoics, Plotinus, the Hermic writers, and Hippocrates, not to speak of the Eastern philosophers, among the ancients; Newton, Homberg, Boerhaave, Hales, Nieuwentyt, and Willis, among moderns. Berkeley tells

elsewhere[1] that he had 'for a long time entertained the opinion, agreeable to many ancient philosophers—that Fire may be regarded as the Animal Spirit of this visible world.' When he came to entertain this opinion he does not say. It is in *Siris* that it first distinctly appears. Vital Fire is there the ultimate link in the physical chain by which changes in nature are concatenated.

This Vital Fire is physical, not metaphysical (sect. 206–213); although it is all-pervading, and governed by wonderful laws, assigned to it by ancient and modern authorities. In various modes and degrees, it is diffused through plants; and, especially after 'lodgment in the native balsam of pines and firs,' it finds its way benignly and beneficially into the human organism, so as to 'warm without heating, to cheer but not inebriate' (sect. 217). We are warned that Newton's elastic Æther is not to be confounded with this invisible animated Fire; nor is it subject to those laws of attraction and repulsion which play the governing part in Newtonian physics (sect. 221–230).

Thus far Berkeley's Chain is physical. But a chain that is *only* physical cannot support itself. It is no final explanation of natural changes, whether mechanical, chemical, or vital. All sensible phenomena, with their *natural causes*, which are only *natural signs*, presuppose the perpetual operation of Active Reason (sect. 231–238; see also sect. 153, 155, 160, 161). Philosophy proper must be spiritual, not mechanical; the facts and laws of physical science are but the sensible expression of Divine Agency (sect. 251–264). Active Intelligence is the only summary explanation of the universe. In Active Reason alone is found the 'golden chain' of intelligible reality.

The last hundred sections of *Siris* accumulate authorities

[1] See *First Letter to Thomas Prior, on the Virtues of Tar-water.* Sect. 16.

on behalf of this spiritual philosophy, which, in its eccentric transformations, here appears reflected through the greatest minds of the ancient world. Those sections connect, by suggestion, early with recent speculation—the anticipations of Pythagoras, Parmenides, Plato, and Plotinus with developments in the German thought of Leibniz, and, after Berkeley, in Schelling and Hegel. This portion of *Siris* is probably the nearest approach in English philosophy of the eighteenth century to German constructive Idealism of the nineteenth. In each section gold may be found.

Perceived Space and absolute Space—blind Fate and spiritual Fate—*Anima Mundi*—Pantheism and Atheism—the antithesis and synthesis of Sense and Intelligence—the actual and the potential existence of Matter—Deity—the origin and various phases of theistic conception—divine and human Personality—the Divine Ideas of Platonism—the Divine Trinity of Personality, Reason, and Life—are all pondered in succession; along with the reported thought, on those deep themes, of Pythagoras, Plato, Aristotle, Theophrastus, Plotinus, Jamblicus, Proclus, Themistius, Simplicius, and the Hermic writers.

Berkeley discerns outlines of his own spiritual conception of nature in the dim intuitions of Greek and Egyptian philosophy (sect. 266–269), with all which he is more in sympathy than with the prevailing mechanical and materialistic science. Ancient notions of Space and Fate seem to him deeper than the modern, and more readily open to a spiritual interpretation (sect. 270–273).

In the modern 'phantom' of uncreated Space, as distinguished from visible and tangible extension—derived neither from sense nor intellect (sect. 271–318), and therefore with Berkeley a phantom negation, the result of λογισμὸς νόθος (sect. 306, 318)—he sees the source of other 'phantoms'—dead Matter, and blind Fate—'children of imagination grafted upon sense' (sect. 292)—with their

sceptical consequences. He even prefers, as more spiritual, the inclination of some early thinkers to represent the universe as an Animal (sect. 273–287); seeing in this at the worst a one-sided expression of immediate and perpetually acting Deity at the heart of all change. *Anima Mundi*, held in various forms in Egypt, Greece, and Alexandria, harmonized with his animating Fire, 'the living, omniform, seminary of the world'; and also with the uniform teaching of his life, as to the dependent reality of Matter, and the need for referring change to the agency of Mind. God is thus (as it were) the Intelligible Soul of the world, by whose perpetual and pervading activity all things are connected in the unity of the Golden Chain; the complicated links of which human science, with weak and faltering hand, tries to display in true scientific order.

So all things finally centre in the unity of Mind, which substantiates all and causes all. This is τὸ Ἕν—the ONE—of Egyptians and Greeks (sect. 287–295); to all created beings the source of unity and identity, of harmony and order, existence and stability. 'It is neither acid nor salt, nor sulphur, nor air, nor æther, nor visible corporeal fire, much less the phantom fate or necessity, that is the real Agent; but, by a certain analysis, a regular connexion and climax, we ascend through all these mediums to a glimpse of the First Mover, invisible, incorporeal, unextended, intellectual source of life and being' (sect. 296).

Thus, by a Chain of innumerable links, we pass from the extreme of Sense, to the extreme of Intelligence; the truths of which last are the really divine science. Accordingly, after great examples among the ancients, ill relished perhaps by modern readers, in an age of 'minute philosophy,' Berkeley 'draws his reader, by insensible transitions, into remote inquiries and speculations, that were perhaps not thought of, either by him or by the author, at first setting out' (sect. 297).

'Theology and Philosophy gently unbind the ligaments that chain the soul down to the earth, and assist her flight toward the sovereign good' (sect. 302). Let us then, Berkeley says in effect, let us rise from our fallen state, by meditating in religious thought upon that contrast yet correlation of Sense and Intelligence, Being and Knowing, the Many and the One, Change and the Eternal, the Individual and the Universal, which lies at the root of whatever is, and which, in these and like modes of conception, has engaged the genuine thinkers in all ages (sect. 301–310). Plato and Aristotle, as he interprets them, did not assign to sensible things an absolute reality, abstracted from percipient Mind. With those ancient sages, unperceived Matter was a dark, indefinable negation, which, with Aristotle, has only potential, not actual existence (sect. 311–319). 'Neither Plato nor Aristotle by Matter understood corporeal substance' as we see it. To them it signified no real, positive being. With the Greeks, Matter was only *pura potentia*, a mere possibility and defect; and, 'since God is absolute perfection and act, it follows that there is the greatest opposition and distance imaginable between God and Matter' (sect. 319).

What then is God? That is the great question which this train of thought suggests. It leads (sect. 320–329) to a restatement of the ultimate conception of Causation which runs through his philosophy. A cause is distinguished from its effects; and the Supreme Power, however involved in the universe in which the Divine Ideas are expressed, is not to be confounded with the universe. The Universal Power is 'a really existing Spirit, transcending all corporeal and sensible things' (sect. 323). A liberal toleration is indeed conceded to the varied language which religious thought employs to express the relation of God to the universe. If we should even say that all concrete things make one God, this would,

he thinks, be an inapt way of expressing a deep truth; but should not be regarded as atheistic, 'so long as Mind or Intellect is admitted to be τὸ ἡγεμονικόν, the governing part' (sect. 288). 'It is nevertheless more respectful, and consequently the truer notion of God, to suppose Him neither made up of parts, nor to be Himself a part of any Whole whatever.' When we find Platonic and Aristotelian philosophers speaking of God as 'mixing with' nature, or 'pervading' nature, he explains this as referring not to mixture in the way of space or extension, but in the way of all-present power, and universal Providence. For *extension* is never applied to mind by Plato and Aristotle; and spiritual things are 'distant from one another' not by *place* but, as Plotinus says, by '*alterity*' (sect. 329).

As a help in the endeavour to rise in contemplation above the selfish feeling and mechanical habit which exclusive study of sensible things is apt to generate, Berkeley, with earnest eloquence, points to the books of ancient philosophers; above all to Plato, 'whose writings are the touchstone of a hasty and shallow mind' (sect. 332). In the remaining aphorisms of *Siris*, he moves in company with him, also with Parmenides, Plotinus, and Proclus, not forgetting the curious Hermic lore which somehow fascinated him in his old age.

In the Ideas of Plato he thinks he finds the beginnings of a reconciliation of philosophy with religion (sect. 335–338). His early sensuous Nominalism is now modified and supplemented by a transcendental Idealism, in which are discerned uncreated necessities of reason that cannot be pictured in sensuous imagination, but by which the evolutions of the world, and the individual mind, should be regulated. This Idealism is dimly present in *Siris*. Here the Ideas are not, like those of Locke, or like the sensuous 'ideas' of the *Principles* and *Dialogues*, 'inert, inactive objects of perception.' They are self-

existent, necessary, uncreated. Nor are they the abstract general ideas against which he had argued long before so emphatically. On the contrary they are 'the most real beings, intellectual and unchangeable; and therefore more real than the fleeting, transient objects of sense; which, *wanting stability*, cannot be objects of science, much less of intellectual knowledge' (sect. 335). 'The most refined human intellect, exerted to its utmost reach, can only seize some imperfect glimpses of the Divine Ideas; abstracted from all things corporeal, sensible, and imaginable. Therefore Pythagoras and Plato treated them in a mysterious manner, concealing rather than exposing them to vulgar eyes; so far were they from thinking that those abstract things, although the most real, were the fittest to influence common minds, or become principles of knowledge, not to say duty and virtue, to the generality of mankind' (sect. 337). 'Nevertheless, as the mind gathers strength by repeated acts, we should not despond, but continue to exert the prime and flower of our faculties, still recovering and reaching on, and struggling into the upper region' (sect. 341).

We are asked to try, in this manner, to rise even above the thought of the Universal Spirit, enlightening and ordering all things; and to enter into the meaning of the ancient tenet of τὸ Ἕν or τὸ Ἀγαθόν, the *fons Deitatis*, by participation in which all exists that exists really, the finite spirits of men included. For Plato thought that in the soul of man, 'prior and superior to intellect, there is Somewhat of a higher nature, by virtue of which we are *One*; and that, by virtue of our *One*, we are most closely joined to Deity' (sect. 345).

What is τὸ Ἕν, thus in a manner common to ourselves, the world, and God? Is it not PERSONALITY? Is not personality the indivisible centre of the human soul, which is a monad so far forth as a person? 'Person is

really that which exists; inasmuch as it alone participates of the divine Unity. Upon mature reflexion the Person or Mind of all created beings seemeth alone indivisible, and to partake most of unity. Sensible things are rather *considered one* (by an act of intelligence) than truly so; they being in a perpetual flux or succession, ever differing and various' (346, 347). Here we find Berkeley's early philosophy—a universe of 'ideas' or 'phænomena,' *realised* in living Persons.

But τὸ Ἕν—the ONE—this abstract personality—seems, as prior to consciousness, to exclude conscious life in God. What is it more than the πρώτη ὕλη of Aristotle?

Berkeley argues (sect. 352) that the ultimate One is necessarily connected with νοῦς or λόγος, as a Second Hypostasis. These two Hypostases are inseparable in Absolute Being or Deity. 'There never was a time supposed wherein τὸ Ἕν subsisted without Intellect (λόγος); the *priority* having been understood as a priority of order or conception, but not a priority of age' (sect. 352). And whoever recognises that the universe is thus grounded in Intellect 'cannot be justly deemed an Atheist.'

Intellect (νοῦς or λόγος), abstracted from Life, is, however, as barren as the One (τὸ Ἕν), abstracted from intellect. Both must participate in Life. Intellect must be living Spirit. Life (ψυχή) is accordingly the Third Hypostasis in the Trinity of the ultimate One. 'Certain it is that the notion of this Trinity is to be found in the writings of many old heathen philosophers; that is to say, a notion of Three Divine Hypostases. Authority, Light, and Life did, to the eye of reason, plainly appear to support, pervade, and animate the mundane system or *Macrocosm*. The same appeared in the *microcosm*; preserving soul and body, enlightening the mind, and moving the affections. And these were conceived to be necessary, universal principles; co-existing and co-operating, in such sort as never to exist

asunder, but on the contrary to constitute One Sovereign of all things. And, indeed, how could Power or Authority avail or subsist without Knowledge? or either without Life and Action?' (sect. 361).

The One must be Thought eternally Living. With this Trinity in the essence of Being *Siris* concludes. Its closing sentences concentrate the protest against selfish and degrading Materialism which eloquently runs through it, and speak in favour of the deeper and therefore truer life that arises amidst the glimpses of the Divine that are open to us, but which our limited and sense-clogged reason can only imperfectly comprehend.

Thus in *Siris* physics continuously pass into metaphysics: the universe is spiritually united in God. Misinterpretation of nature in the physical chain need not intercept the metaphysical or religious light which reveals a divine concatenation of Reason in all things. *Siris*, in this, recalls the *Timæus* of Plato, so often referred to in its aphorisms. Its sense-universe, substantiated in and causally animated by God, of whose Ideas the natural laws of the sensible world are an expression, does not disappear in its errors of therapeutics. Mistaken interpretations of the divine *physical* meaning do not imply that there is no higher divine meaning.

The suggestive title—*Siris*[1] (σειρά, a chain)—was prefixed

[1] '*Seiris*,' De Quincey says, 'ought to have been the name.'

The notion of universal divine concatenation in Nature is one which runs through ancient and modern philosophy, from Homer and Pythagoras, through Plato and Proclus, into Bacon, Leibniz, and Berkeley. It is prominent in the Hermic writings and in Paracelsus, being a favourite with the alchemists.

Some curious gleanings on this subject may be found in *Notes and Queries*, Second Series, vol. III. pp. 63–65, 81–84, 104–107, in an essay on the *Aurea Catena Homeri*, a rare work published in Germany early in the eighteenth century. Its author follows the Egyptians and most ancient sages in regarding Nature as a series of rings or revolving circles, forming a vast Chain, which links God with His humblest creature. The affinity between the Universal Chain and the notions of Paracelsus is

to the second edition, published a few weeks after the first. The first edition appeared in April, 1744, in London, 'printed for C. Hitch, in Pater-noster-row; and C. Davis, against Gray's Inn, Holbourn.'

The medical celebrity of the work was extraordinary for some years after its appearance. Three editions were called for in 1744. Others succeeded in 1746 and 1748.

A French translation of *Siris* appeared at Amsterdam in 1745. It is entitled *Recherches sur les Vertus de l'eau de Goudron, où l'on a joint des Reflexions Philosophiques sur divers autres sujets importans.* Berkeley's *First Letter to Prior* is translated in this volume, which also includes a letter addressed to the author of the German translation of *Siris*. The French translation is referred to in the *Acta Eruditorum*, Leips. 1746, pp. 446–449.

Part of *Siris* was translated into German at Göttingen in 1746; but only the parts which relate to the preparation and medicinal properties of tar-water, along with several tracts on the subject, including Berkeley's *Letters* to Prior, and the volume contains an account of some German analyses of tar-water [1].

obvious. Berkeley repeatedly refers in *Siris* to the Paracelsic chemistry.

The subject is pursued in *Notes and Queries*, Second Series, vol. XII. 161–163, 181–183. The writer (p. 163) suggests that it was with reference to the *Aurea Catena Homeri*, 'that Bishop Berkeley wrote and named that most strange yet most choice composition, his *Siris*; which, announced as an Essay on Tar-water, begins with Tar and ends with the Trinity, the *omne scibile* forming the interspace; an essay which, in spite of the Tar-water, must delight the heart of every Platonist.'

Berkeley's Chain or Scale in *Siris* is the gradation of physical effects linked to physical causes, in successively ascending circles, from tar-water to Supreme Mind, of which physical causes are merely the passive instruments and interpretable signs. According to *Siris*, this chain of physical causes, which are all in turn effects, is at last physically enchained by invisible Fire, itself immediately dependent on Supreme Active Reason. So Bacon:—'When a man seeth the dependence of causes, and the works of Providence, then, according to the allegory of the poets, he will easily believe that the highest link of Nature's Chain must needs be tied to the foot of Jupiter's chair.'—(*Adv. of Learning*, p. 12.)

[1] I have not seen this translation. I am indebted for an account

Prior mentions translations of *Siris* into Low Dutch and Portuguese, which, as well as the French and German translations, must have been in circulation in 1746. The Dutch version was published at Amsterdam in 1745. Of the Portuguese one I have not been able to obtain any further account.

The use of tar-water as a medicine soon became widely known in Europe. No work of Berkeley's produced so extensive and sudden a sensation as *Siris*. This was not on account of the uncommon metaphysical thought by which it was pervaded, but because it offered a Catholic remedy for the diseases of mankind. The use of tar-water as a medicine became fashionable for a time. 'It is impossible,' says Mr. Duncombe, writing to Archbishop Herring in June, 1744, 'it is impossible to write a letter now without tincturing the ink with tar-water. This is the common topic of discourse, both among the rich and poor, high and low; and the Bishop of Cloyne has made it as fashionable as going to Vauxhall or Ranelagh. However, the faculty in general and the whole posse of apothecaries are very angry both with the author and the book; which makes many people suspect it is a good thing.' To which Herring writing a few days after from York, rejoins:— 'Though we are so backward in some sorts of intelligence, we are perfectly acquainted with the virtues of tar-water; some have been cured as they think, and some made sick by it: I do think it is a defect in the good bishop's recommendation of it, that he makes it a Catholicon; but I daresay he is confident he believes it such.'

of it to Dr. Ueberweg, the late distinguished Professor of Logic and Metaphysics at Königsberg. It is curious that the metaphysical part of *Siris*, having affinities both with ancient Greek and modern German speculation, has not been translated into German, nor adequately recognised as representing the later, as distinguished from the earlier, Idealism of Berkeley. The relation between the two is well unfolded in an essay by Dr. Carl V. Tower, Instructor in Philosophy in the University of Michigan (*Ann Arbor.*, 1899).

Siris was the occasion of a considerable mass of controversial tracts in the last years of Berkeley's life. Controversy was confined to the healing virtues of the proposed Panacea; the divine philosophy with which *Siris* is charged was wholly neglected. Some gave vent to the anger of 'the faculty' with an ecclesiastical intruder, whose Universal Medicine threatened to supersede them in their own province.

Berkeley further illustrated the medicinal virtues of tar-water in the three *Letters* to his friend Thomas Prior, in 1744, 1746, and 1747; the *Letter* to Dr. Hales, in 1747; and in the *Further Thoughts on Tar Water*, in 1752, which are appended to *Siris* in this edition.

Prior was as unwearied as the author of *Siris* himself in vindicating the new medicine, and in proclaiming its virtues. He communicated many cases of supposed cures to the *Dublin Journal* and the *Gentleman's Magazine*. In July, 1744, he published *An Authentic Narrative, containing a record of various Cases illustrative of the Virtues of Tar Water*. This was the germ of his larger work—*An Authentic Narrative of the Success of Tar Water in curing a great number and variety of Distempers; with Remarks and Occasional Papers relative to the Subject*, which appeared in 1746. It was dedicated to the well-known Earl of Chesterfield, who was then Lord-Lieutenant of Ireland.

About two months after *Siris* appeared, a Tar-water Dispensary was opened in London; as announced in a tract 'for the direction of patients in different diseases, published by the Proprietors of the Tar-water Warehouse, behind the Thatched House Tavern, in St. James's Street,' entitled, *The Medical Virtues of Tar-Water fully explained, by the Right Rev. Dr. George Berkeley, Lord Bishop of Cloyne in Ireland. To which is added, the Receipt for making it, and Instructions to know by the colour and taste of the Water when the Tar is good*

and of the right sort. Together with a plain Explanation of the Bishop's physical Terms. Dublin and London, 1744.

Amongst the more important tracts in the controversy to which the medicinal portion of *Siris* gave rise are the following:—

1. *Anti-Siris; or English Wisdom exemplified by various examples, but particularly the present demand for Tar-water, on so unexceptionable authority as that of a R——t R——d itinerant Chemist, and Graduate in Divinity and Metaphysics. In a Letter from a Foreign Gentleman at London to his Friend abroad.* This tract of 80 pp., which appeared in May, 1744, was one of the earliest attacks upon the new medicine.

2. *A Letter to the Right Rev. the Bishop of Cloyne, occasioned by His Lordship's Treatise on the Virtues of Tar-water. Impartially examining how far that medicine deserves the character his Lordship has given of it.* London, June, 1744. A second edition appeared later in the same year. It was criticised in—

3. *Remarks on a Letter to the Right Rev. the Bishop of Cloyne, occasioned by his Treatise of Tar-water.* July, 1744.

4. *Reflections concerning the Virtues of Tar-water. Wherein it is proved by experience that the present preparation is not founded on philosophical principles, and that, as now prepared, it may probably occasion more disease than it can possibly cure. With hints for its improvement, so as to make it a pleasant and efficacious medicine.* By H. Jackson, chemist. London, June, 1744.

5. *Siris in the Shades: A Dialogue concerning Tar-Water.* July, 1744.

6. *A Cure for the Epidemical Madness of drinking Tar-water, lately imported from Ireland by a certain R——t R——d Doctor. In a Letter to his Lordship.* By T. R., M.D. London, July, 1744.

7. *The Bishop of Cloyne defended, and Tar-water proved useful by theory and experiment. In answer to T. R., M.D.* By Philanthropos. *Ecce vox Naturæ, vox Dei.* London, August, 1744.

8. *Remarks on the Bishop of Cloyne's Siris.* By Risorius, M.A., of Oxford. London, November, 1744.

9. *An Account of Some Experiments and Observations on Tar-water: wherein is shewn the quantity of Tar that is therein. Which was read before the Royal Society.* By Stephen Hales, D.D., F.R.S. London (December), 1744. A second edition of this tract appeared in 1747 (when the author of *Siris* also addressed his *Letter* to Hales), having appended to it—

10. *A Letter to the Reverend Dr. Hales, concerning the Nature of Tar, and a Method of obtaining its medical virtues, free from its hurtful oils: whereby also the Strength of each dose may be the better ascertained.* By Andrew Reid, Esq. Dated, London, March 25, 1747.

11. *A Proposal for the improvement of the practice of Medicine. Illustrated by an example relative to the Small Pox. To which is added a Discourse on Medicinal Indications, Specifics, Panaceas; wherein are introduced Some Remarks on a book entitled 'Siris, or the Properties of Tar-water.'* By Malcolm Flemyng, M.D. Printed for the Author at Hull, by G. Ferriby, 1748.

12. *Reflections upon Catholicons, or Universal Medicines.* By Thomas Knight, M.D. London, 1749.

After Berkeley's death, in 1753, the Tar-water controversy, occasioned by *Siris*, gradually subsided; but medical virtue in tar, less extensive than that claimed for it by Berkeley, was still recognised by physicians[1].

[1] Dr. Cullen, in his *Materia Medica* (vol. II. p. 334), written in 1789, when the rage for tar-water had ceased, says that the commendations of its patrons were often 'extravagant and ill founded'; but that those who disparaged it, while they 'had some foundation for their opinions, told many falsehoods about it.' He acknowledges

The chief interest of *Siris*, however, is metaphysical or theosophical, not medical. The claim of tar-water to be a Panacea is no longer pressed. The train of thought which its supposed virtues awakened in Berkeley's mind is of more lasting value; not only as the culmination of his life-long meditations about the Power at work in the universe in which he found himself, but also from its greater affinity with speculation in the century which followed that in which he lived. Till lately *Siris* has not been taken into account in the ordinary philosophical estimate of Berkeley, in which his supposed annihilation of the material world, on postulates of sensuous empiricism, has placed him among paradoxical sceptics, and concealed the Constructive Theism in which his thought really centres. Its mystical and hardly coherent expression, as it struggles through miscellaneous, uncriticised, and learned lore in *Siris*, in eccentric association with a disputed hypothesis in therapeutics, in part accounts for this. The chief lesson of *Siris*, like that in the *Analyst*, was lost in controversies which were only incidental to the leading conception and design of each. That the inevitable presence of mystery in human faith need not involve disintegration of faith, which the *Analyst* was intended to teach, fell out of sight in the mazes of a seven years' controversy in abstract mathematics. And the divine philosophy of *Siris*, with its suggested resolution of all the so-called 'forces' of physics into a single invisible Fire, the immediate physical organ of the Universal Power that explains the Whole, failed

its usefulness in many diseases. Its virtues he attributes to the *vegetable acid* contained in the tar, and extracted from it by water. This opinion, he says, is confirmed by Reid (in his *Letter to Dr. Hales*), who quotes Glauber and Boerhaave in support of the virtues of the acid.

A watery extract of tar contains ascetic acid, carbolic acid, and creosote. Tar itself is the volatile matter obtained by the distillation of wood, and is a very complex mixture of elements, which differ in volatility; e. g. ascetic acid, light and heavy oil of tar, and pitch. Most of them are insoluble in water.

to find its way through experiments and discussions in the *materia medica*, more practically interesting, as it seemed, and at any rate more on the level of ordinary intelligence. Berkeley has accordingly been associated with the *sensuous ideaism*[1] that was prominent in the *Principles* and *Dialogues*, rather than with the *Divine Idealism* that is latent in the less luminous aphorisms of his later years.

[1] Not Idealism.

[1]CONTENTS

[1] The 'Contents' added in the later editions.

[[1]SIRIS:]

A CHAIN OF PHILOSOPHICAL REFLEXIONS AND INQUIRIES, &c.

For Introduction to the following piece, I assure the reader that nothing could, in my present situation, have induced me to be at the pains of writing it, but a firm belief that it would prove a valuable present to the public. What entertainment soever the reasoning or notional part may afford the Mind, I will venture to say, the other part seemeth so surely calculated to do good to the Body that both must be gainers. For, if the lute be not well tuned, the musician fails of his harmony. And, in our present state, the operations of the mind so far depend on the right tone or good condition of its instrument, that anything which greatly contributes to preserve or recover the health of the Body is well worth the attention of the Mind. These considerations have moved me to communicate to the public the salutary virtues of Tar-water; to which I thought myself indispensably obliged by the duty every man owes to mankind. And, as effects are linked with their causes, my thoughts on this low but useful theme led to farther inquiries, and those on to others; remote perhaps and speculative, but I hope not altogether useless or unentertaining.

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1. In certain parts of America[2], Tar-water is made by putting a quart of cold water to a quart of tar, and stirring them well together in a vessel, which is left standing till

[1] Added in second edition.

[2] Cf. sect. 2, 17.

the tar sinks to the bottom. A glass of [1 clear] water, being poured off for a draught, is replaced by the same quantity of fresh water, the vessel being shaken and left to stand as before. And this is repeated for every glass, so long as the tar continues to impregnate the water sufficiently, which [2 appears] by the smell and taste. But, as this method produceth tar-water of [3 a nauseous kind, and] different degrees of strength, I choose to make it in the following manner: Pour a gallon of cold water on a quart of tar, and stir, [3 work,] and mix them thoroughly [3 together], with a [3 wooden] ladle or flat stick, for the space of [4 five or six] minutes; after which the vessel must stand [3 close covered and unmoved] [5 three days and nights], that the tar may have [3 full] time to subside; and then the clear water, [3 having been first carefully skimmed without shaking the vessel], is to be poured off, and kept [3 in bottles well stopped] for use[6], no more being made from the same tar, which may still serve for common [7 uses].

2. [8 The] cold infusion of tar hath been used in some of our Colonies[9], as a preservative or preparative against the

[1] Omitted in the later editions.

[2] 'will appear'—in early editions.

[3] Added in the later editions.

[4] 'three or four'—in the early editions.

[5] 'eight and forty hours'—in the early editions.

[6] [I make this water stronger than that first prescribed in *Siris*, having found, on more general experience, that five or six minutes' stirring, when the water is carefully cleared and skimmed, agrees with most stomachs.]—AUTHOR. This note was added in the later editions.

[7] 'uses'—'purposes,' in the early editions. The manner of making tar-water, as well as the quality of the tar, is a very important consideration with Berkeley; cf. sect. 115. See also his *First Letter to Thomas Prior*, sect. 2; *Second Letter*, sect. 2-5; *Letter to Dr. Hales*; and *Farther Thoughts on Tar-water*. The variations in the directions given in the successive editions of *Siris*, and also of the other works, are curious. Establishments for the manufacture of tar-water, according to Berkeley's rules, were opened in London, Dublin, Göttingen, and elsewhere, soon after the appearance of *Siris*.

[8] 'This'—in the early editions.

[9] He refers to our American Colonies (cf. sect. 17), where tar-water was used medicinally among the Indians and others, as he seems to have learned in Rhode Island. His trial of the remedy when small-pox prevailed at Cloyne, and its apparent efficacy in various diseases (sect. 4-7), led him to farther reflexion about the principle of Causation in nature, and the

small-pox; which foreign practice induced me to try it in my own neighbourhood, when the small-pox raged with great violence[1]. And the trial fully answered my expectation: all those within my knowledge who took the tar-water having either escaped that distemper, or had it very favourably. In one family there was a remarkable instance of seven children, who came all very well through the small-pox, except one young child which could not be brought to drink tar-water as the rest had done.

3. Several were preserved from taking the small-pox by the use of this liquor; others had it in the mildest manner; and others, that they might be able to take the infection, were obliged to intermit drinking the tar-water. I have found it may be drunk with great safety and success for any length of time, and this not only before, but also during the distemper. The general rule for taking it is:—about half a pint night and morning, on an empty stomach; which quantity may be varied, according to the case and age of the patient, provided it be always taken on an empty stomach, and about two hours before or after a meal. [[2] For children and squeamish persons it may be made weaker, or given little and often; more water or less stirring makes it weaker, as less water or more stirring makes it stronger. It should not be lighter than French, nor deeper coloured than Spanish white wine. If a spirit be not very sensibly perceived on drinking, either the tar must have been bad, or already used, or the tar-water carelessly made or kept. Particular experience will best shew how much and how strong the stomach can bear, and what are the properest times for taking it. I apprehend no danger from excess in the use of this medicine.]

4. It seemed probable that a medicine of such efficacy in a distemper attended with so many purulent ulcers might be also useful in other foulnesses of the blood; accordingly, I tried it on several persons infected with cutaneous eruptions and ulcers, who were soon relieved, and soon after cured. Encouraged by these successes, I ventured to advise it in the foulest distempers, wherein it proved

ulterior physical and metaphysical speculation of *Siris*.

[1] At Cloyne in 1741.

[2] Added in the later editions. Cf. sect. 115.

much more successful than salivations and wood drinks had done.

5. Having tried it in a great variety of cases, I found it succeeded beyond my hopes: in a tedious and painful ulceration of the bowels; in a consumptive cough, and (as appeared by expectorated pus) an ulcer in the lungs; in a pleurisy and peripneumony. And when a person who for some years had been subject to erysipelatous fevers perceived the usual forerunning symptoms to come on, I advised her to drink tar-water, which prevented the erysipelas.

6. I never knew anything so good for the stomach[1] as tar-water: it cures indigestion and gives a good appetite. It is an excellent medicine in an asthma. It imparts a kindly warmth and quick circulation to the juices without heating, and is therefore useful, not only as a pectoral and balsamic, but also as a powerful and safe deobstruent in cachetic and hysteric cases. As it is both healing and diuretic, it is very good for the gravel. I believe it to be of great use in dropsy, having known it cure a very bad anarsaca in a person whose thirst, though very extraordinary, was in a short time removed by the drinking of tar-water[2].

7. The usefulness of this medicine in inflammatory cases is evident, from what has been already observed. (Sect. 5.) And yet some perhaps may suspect that, as the tar itself is sulphureous, tar-water must be of a hot and inflaming nature[3]. But it is to be noted that all balsams contain an acid spirit, which is in truth a volatile salt. Water is a menstruum that dissolves all sorts of salts, and draws them from their subjects. Tar, therefore, being

[1] This is repeated in various places. Cf. sect. 21, 68, 80, 87, &c. The tonic properties of tar-water were generally appreciated, with the support of high medical authority.

[2] In short, it is regarded by him as a Panacea.

[3] This objection to tar-water is urged in several of the letters and pamphlets written against the supposed Panacea. Berkeley here replied by anticipation. Cf. sect. 74–79. The objection was afterwards put in fiery language by Dr. Knight, in his *Reflections upon Catholicons*. Prior, in his *Authentic Narrative* (pp. 159–60), quotes a letter by 'Dr. De Linden, a German physician now in London,' in refutation of the error—by him erroneously attributed to *Siris*—that tar-water is heating, and tends to produce inflammation in the blood.

a balsam, its salutary acid is extracted by water; which yet is incapable of dissolving its gross resinous parts, whose proper menstruum is spirit of wine. Therefore tar-water, not being impregnated with resin, may be safely used in inflammatory cases: and in fact it hath been found an admirable febrifuge, at once the safest cooler and cordial.

8. The volatile salts[1] separated by infusion from tar, may be supposed to contain its specific virtues. Mr. Boyle and other later chemists are agreed that fixed salts are much the same in all bodies. But it is well known that volatile salts do greatly differ, and the easier they are separated from the subject, the more do they possess of its specific qualities. Now the most easy separation is, by the infusion of tar in cold water, which to smell and taste shewing itself well impregnated may be presumed to extract and retain the most pure volatile and active particles of that vegetable balsam.

9. Tar was by the ancients esteemed good against poisons, ulcers, the bites of venomous creatures; also for phthisical, scrofulous, paralytic, and asthmatic persons[2]. But the method of rendering it an inoffensive medicine and agreeable to the stomach, by extracting its virtues in cold water, was unknown to them. The leaves and tender tops of pine and fir are in our times used for diet drinks, and allowed to be antiscorbutic and diuretic. But the most elaborate juice, salt, and spirit of evergreens, are to be found in tar; whose virtues extend not to animals alone, but also to vegetables. Mr. Evelyn, in his treatise on *Forest Trees*[3], observes with wonder, that stems of trees, smeared over with tar, are preserved thereby from being hurt by the invenomed teeth of goats, and other injuries, while every other thing of an unctuous nature is highly prejudicial to them.

[1] Cf. sect. 123.

[2] See Pliny, *Hist. Nat.* Lib. XXIV. c. 22–26. It seems that the first use of tar was medicinal.

[3] *Sylva: or a Discourse on Forest Trees, and the Propagation of Timber in His Majesty's Dominions* (1664). John Evelyn (1620–1706)—'Sylva Evelyn'—the typical English gentleman and royalist of his time, eminent in natural science, and also in philanthropic service. His interesting *Memoirs* were published in 1818.

10. It seems that tar and turpentine may be had, more or less, from all sorts of pines and firs whatsoever; and that the native spirits and essential salts of those vegetables are the same in turpentine and common tar[1]. In effect, this vulgar tar, which cheapness and plenty may have rendered contemptible, appears to be an excellent balsam, containing the virtues of most other balsams; which it easily imparts to water, and by that means readily and inoffensively insinuates them into the habit of the body.

11. The resinous exudations of pines and firs are an important branch of the materia medica, and not only useful in the prescriptions of physicians, but have been also thought otherwise conducive to health. Pliny[2] tells us that wines in the time of the old Romans were medicated with pitch and resin; and Jonstonus in his *Dendrographia*[3] observes, that it is wholesome to walk in groves of pine-trees, which impregnate the air with balsamic particles. That all turpentines and resins are good for the lungs, against gravel also and obstructions, is no secret. And that the medicinal properties of those drugs are found in tar-water, without heating the blood, or disordering the stomach, is confirmed by experience; and particularly, that phthisical and asthmatic persons receive speedy and great relief from the use of it.

12. Balsams, as all unctuous and oily medicines, create a nauseating in the stomach. They cannot therefore be taken in substance so much or so long as to produce all those salutary effects, which, if thoroughly mixed with the blood and juices, they would be capable of producing. It must therefore be a thing of great benefit to be able to introduce any requisite quantity of their volatile parts into the finest ducts and capillaries, so as not to offend the stomach, but, on the contrary, to comfort and strengthen it in a great degree.

[1] The sources of the resins, vegetable tar, pitch, and turpentine, as well as various modes of procuring them, in use in ancient and modern times, are mentioned in sect. 10–28.

[2] *Hist. Nat.* Lib. XIV. c. 25.

[3] *Dendrographiæ, sive Historiæ Naturalis de arboribus et fruticibus, tam nostri quam peregrini orbis libri* (Francf., 1662). Joannes Jonstonus, M.D. (1603–1675), a Polish naturalist, author of works in botany and zoology.

13. According to Pliny[1], liquid pitch (as he calls it) or tar was obtained by setting fire to billets of old fat pines or firs. The first running was tar, the latter or thicker running was pitch. Theophrastus[2] is more particular: he tells us the Macedonians made huge heaps of the cloven trunks of those trees, wherein the billets were placed erect beside each other: that such heaps or piles of wood were sometimes a hundred and eighty cubits round, and sixty or even a hundred high: and that, having covered them with sods of earth to prevent the flame from bursting forth (in which case the tar was lost), they set on fire those huge heaps of pine or fir, letting the tar and pitch run out in a channel.

14. Pliny[3] saith, it was customary for the ancients to hold fleeces of wool over the steam of boiling tar, and squeeze the moisture from them, which watery substance was called *pissinum*. Ray[4] will have this to be the same with the *pisselæum* of the ancients; but Hardouin, in his notes on Pliny, thinks the *pisselæum* to have been produced from the cones of cedars. What use they made of these liquors anciently I know not; but it may be presumed they were used in medicine, though at present, for aught I can find, they are not used at all.

15. From the manner of procuring tar (sect. 13) it plainly appears to be a natural production, lodged in the vessels of the tree, whence it is only freed and let loose (not made) by burning. If we may believe Pliny[5], the first running or tar was called *cedrium*, and was of such efficacy to preserve from putrefaction that in Egypt they embalmed dead bodies with it. And to this he ascribes their mummies continuing uncorrupted for so many ages.

[1] *Hist. Nat.* Lib. XVI. c. 22.

[2] *Hist. Plant.* Lib. IX. c. 3. This work of Theophrastus, a pupil of Aristotle, referred to in this and in the following sections, is the oldest extant treatise in botany and vegetable physiology. Pliny, so often quoted in this part of *Siris*, who describes more than a thousand species of plants, is the next great authority, in chronological order, in this department. Thereafter little progress was made until the study revived in modern times.

[3] *Hist. Nat.* Lib. XV. c. 7.

[4] This and similar references (sect. 20, 25) are to the *Historia Plantarum* (1694) of John Ray (1628-1705), the English naturalist of the seventeenth century, well known also as author of the *Wisdom of God in the Works of the Creation*. See his *Hist. Plant.* Lib. XXV.

[5] *Hist. Nat.* Lib. XVI. c. 21.

16. Some modern writers inform us that tar flows from the trunks of pines and firs, when they are very old, through incisions made in the bark near the root; that pitch is tar inspissated[1]; and both are the oil of the tree grown thick and ripened with age and sun. The trees, like old men, being unable to perspire, and their secretory ducts obstructed, they are, as one may say, choked and stuffed with their own juice.

17. The method used by our Colonies in America for making tar and pitch is in effect the same with that of the ancient Macedonians; as appears from the account given in the *Philosophical Transactions*[2]. And the relation of Leo Africanus[3], who describes, as an eye-witness, the making of tar on Mount Atlas, agrees in substance with the methods used by the Macedonians of old, and the people of New England at this day.

18. Jonstonus, in his *Dendrographia*, is of opinion, that pitch was anciently made of cedar, as well as of the pine and fir grown old and oily. It should seem indeed that one and the same word was used by the ancients in a large sense, so as to comprehend the juices issuing from all those trees. Tar and all sorts of exudations from evergreens are, in a general acceptation, included under the name resin. Hard coarse resin or dry pitch is made from tar, by letting it blaze till the moisture is spent. Liquid resin is properly an oily viscid juice oozing from the bark of evergreen trees, either spontaneously or by incision. It is thought to be the oil of the bark inspissated by the sun. As it issues from the tree it is liquid, but becomes dry and hard, being condensed by the sun or by fire.

19. According to Theophrastus[4], resin was obtained by stripping off the bark from pines, and by incisions made in the silver fir and the pitch pine. The inhabitants of

[1] 'inspissated'—'thickened'—a term used by Evelyn; also by Bacon and others.

[2] In the *Philos. Trans.*, No. 243, we have an account of the way of making tar at Marseilles. See also No. 228.

[3] In the *Africæ Descriptio* of this learned Moor. Leo (cir. 1470–1530) made extensive journeys in the north of Africa about the beginning of the sixteenth century. His book has been translated from the original Arabic into various languages. An English version appeared in 1600.

[4] *Hist. Plant.* Lib. IX. c. 2. A similar account of the way of extracting resin from pine is given by Pliny.

Mount Ida, he tells us, stripped the trunk of the pine on the sunny side two or three cubits from the ground. He observes that a good pine might be made to yield resin every year; an indifferent every other year; and the weaker trees once in three years; and that three runnings were as much as a tree could bear. It is remarked by the same author that a pine doth not at once produce fruit and resin, but the former only in its youth, the latter in its old age.

20. Turpentine is a fine resin. Four kinds of this are in use. The turpentine of Chios or Cyprus, which flows from the turpentine tree: the Venice turpentine, which is got by piercing the larch tree: the Strasburgh turpentine, which Mr. Ray informs us is procured from the knots of the silver fir; it is fragrant and grows yellow with age: the fourth kind is common turpentine, neither transparent nor so liquid as the former; and this Mr. Ray taketh to flow from the mountain pine. All these turpentines are useful in the same intentions. Theophrastus[1] saith, the best resin or turpentine is got from the *terebinthus* growing in Syria and some of the Greek islands. The next best from the silver fir and pitch pine.

21. Turpentine is on all hands allowed to have great medicinal virtues. Tar and its infusion contain those virtues. Tar-water is extremely pectoral and restorative; and, if I may judge from what experience I have had, it possesseth the most valuable qualities ascribed to the several balsams of Peru, of Tolu, of Capivi, and even to the balm of Gilead; such is its virtue in asthmas and pleurisies, in obstructions and ulcerous erosions of the inward parts. Tar in substance mixed with honey I have found an excellent medicine for coughs. Balsams, as hath been already observed, are apt to offend the stomach, but tar-water may be taken without offending the stomach. For the strengthening whereof it is the best medicine I have ever tried.

22. The folly of man rateth things by their scarceness, but Providence hath made the most useful things most common. Among those liquid oily extracts from trees and shrubs which are termed balsams, and valued for

[1] See *Hist. Plant.* Lib. IX. c. 2. The passages of Theophrastus referred to, in sect. 25, 28, 39, are in this and the following chapter.

medicinal virtues, tar may hold its place as a most valuable balsam. Its fragrancy sheweth that it is possessed of active qualities, and its oiliness that it is fitted to retain them. This excellent balsam may be purchased for a penny a pound, whereas the balsam of Judea, when most plenty, was sold on the very spot that produced it, for double its weight in silver, if we may credit Pliny[1]; who also informs us, that the best balsam of Judea flowed only from the bark, and that it was adulterated with resin and oil of turpentine. Now, comparing the virtues I have experienced in tar with those I find ascribed to the precious balm of Judea, of Gilead, or of Mecha, (as it is diversly called), I am of opinion that the latter is not a medicine of more value or efficacy than the former.

23. Pliny[2] supposed amber to be a resin, and to distil from some species of pine—which he gathered from its smell. Nevertheless, its being dug out of the earth shews it to be a fossil, though of a very different kind from other fossils. But thus much is certain, that the medicinal virtues of amber are to be found in the balsamic juices of pines and firs. Particularly the virtues of the most valuable preparation, I mean salt of amber, are in a great degree answered by tar-water, as a detergent, diaphoretic, and diuretic.

24. There is, as hath been already observed, more or less oil and balsam in all evergreen trees, which retains the acid spirit, that principle of life and verdure; the not retaining whereof in sufficient quantity causeth other plants to droop and wither. Of these evergreen trees productive of resin, pitch and tar, Pliny[3] enumerates six kinds in Europe; Jonstonus reckons up thrice that number of the pine and fir family. And, indeed, their number, their variety, and their likeness, make it difficult to be exact.

25. It is remarked, both by Theophrastus and Jonstonus, that trees growing in low and shady places do not yield so good tar as those which grow in higher and more exposed situations[4]. And Theophrastus farther observes,

[1] *Hist. Nat.* Lib. XII. c. 54.
[2] *Ibid.* Lib. XXXVII. c. 11.
[3] *Ibid.* Lib. XVI. c. 16–19.
[4] Cf. sect. 28. Berkeley lays stress, for medicinal purposes, on the quality of the tar. 'As there is as great difference in tar as in any commodity whatsoever,' says

that the inhabitants of Mount Ida in Asia, who distinguish the Idean pine from the maritime, affirm, that the tar flowing from the former is in greater plenty, as well as more fragrant than the other. Hence, it should seem the pines or firs in the mountains of Scotland might be employed that way, and rendered valuable; even where the timber, by its remoteness from water carriage, is of small value. What we call the Scotch fir is falsely so called, being in truth a wild forest pine, and (as Mr. Ray informs us) agreeing much with the description of a pine growing on Mount Olympus in Phrygia, probably the only place where it is found out of these islands; in which of late years it is so much planted and cultivated with so little advantage, while the cedar of Lebanon might perhaps be raised, with little more trouble, and much more profit and ornament.

26. The pines, which differ from the firs in the length and disposition of their leaves and hardness of the wood, do not, in Pliny's [1] account, yield so much resin as the fir-trees. Several species of both are accurately described and delineated by the naturalists. But they all agree so far as to seem related. Theophrastus gives the preference to that resin which is got from the silver fir and pitch-tree (ἐλάτη and πίτυς) before that yielded by the pine, which yet he saith is in greater plenty. Pliny [2], on the contrary, affirms that the pine produceth the smallest quantity. It should seem therefore that the interpreter of Theophrastus might have been mistaken, in rendering πεύκη by *pinus*; as well as Jonstonus, who likewise takes the pine for the πεύκη of Theophrastus. Hardouin will have the pinus of Pliny to have been by others called πεύκη, but by Theophrastus

the author of *The Medical Virtues of Tar Water* (1744), 'the persons who intend to make it are cautioned as to the following particulars, lest Plantation tar, or tar used before, should be imposed upon them. The true properties of the right tar-water are that there should be an acid in the taste; the water when made should be as transparent as sherry; and the smell quite even, and no way offensive to any but those who have an antipathy to the smell of tar in general. Whereas the other has none of the acid; *which is the principal advantageous property.*' North American, but especially Norwegian, tar is recommended. The tar of the Thuringian forest was also in high esteem.

[1] *Hist. Nat.* Lib. XVI. c. 16–18. See also Hardouin's notes on Pliny.

[2] *Ibid.*

πίτυς. Ray thinks the common fir, or *picea* of the Latins, to be the male fir of Theophrastus. This was probably the spruce fir; for the *picea*, according to Pliny[1], yields much resin, loves a cold and mountainous situation, and is distinguished, *tonsili facilitate*, by its fitness to be shorn, which agrees with the spruce-fir, whereof I have seen close-shorn hedges.

27. There seems to have been some confusion in the naming of these trees, as well among the ancients as the moderns. The ancient Greek and Latin names are by later authors applied very differently. Pliny[2] himself acknowledgeth it is not easy even for the skilful to distinguish the trees by their leaves, and know their sexes and kinds; and that difficulty is since much increased, by the discovery of many new species of that evergreen tribe, growing in various parts of the globe. But descriptions are not so easily misapplied as names. Theophrastus tells that πίτυς differeth from πεύκη among other things, in that it is neither so tall nor so straight, nor hath so large a leaf. The fir he distinguisheth into male and female: the latter is softer timber than the male; it is also a taller and fairer tree, and this is probably the silver fir.

28. To say no more on this obscure business, which I leave to the critics, I shall observe that according to Theophrastus not only the turpentine-trees, the pines, and the firs yield resin or tar, but also the cedars and palm-trees; and the words *pix* and *resina* are taken by Pliny in so large a sense as to include the weepings of the lentiscus and cypress, and the balms of Arabia and Judea; all which perhaps are near of kin, and in their most useful qualities concur with common tar, especially the Norwegian, which is the most liquid, and best for medicinal uses of any that I have experienced. Those trees that grow on mountains, exposed to the sun or the north wind[3], are reckoned by Theophrastus to produce the best and purest tar; and the Idæan pines were distinguished from those growing on the plain, as yielding a thinner, sweeter, and better scented tar; all which differences I think I have observed, between the tar that comes from Norway, and that which comes from low and swampy countries.

[1] *Hist. Nat.* Lib. XVI. c. 18. See Hardouin's notes on Pliny.
[2] *Ibid.* c. 19. [3] Cf. sect. 25.

29. Agreeable to the old observation of the Peripatetics, that heat gathereth homogeneous things, and disperseth such as are heterogeneous, we find Chemistry is fitted for the analysis of bodies[1]. But the chemistry of nature is much more perfect than that of human art, inasmuch as it joineth to the power of heat that of the most exquisite mechanism. Those who have examined the structure of trees and plants by microscopes have discovered an admirable variety of fine capillary tubes and vessels, fitted for several purposes, as the imbibing or attracting of proper nourishment, the distributing thereof through all parts of the vegetable, the discharge of superfluities, the secretion of particular juices. They are found to have ducts answering to the tracheæ in animals, for the conveying of air; they have others answering to lacteals, arteries, and veins. They feed, digest, respire, perspire, and generate their kind, and are provided with organs nicely fitted for all those uses.

30. The sap vessels are observed to be fine tubes running up through the trunk from the root. Secretory vessels are found in the bark, buds, leaves, and flowers. Exhaling vessels, for carrying off excrementitious parts, are discovered throughout the whole surface of the vegetable. And (though this point be not so well agreed) Dr. Grew, in his *Anatomy of Plants*[2], thinks there appears a circulation of the sap, moving downwards in the root, and feeding the trunk upwards.

31. Some difference indeed there is between learned men, concerning the proper use of certain parts of

[1] In sect. 29–39 we have speculation about the anatomy and physiology of vegetables, and their analogy to animal organisms. They breathe, feed, digest, perspire, and generate; and pines and firs especially, under the action of the sun, secrete a balsam, which, perspiring through the bark, hardens into resin. It is this secretion, so tenacious of the *acid spirit* or *vegetable soul*, which is, he suggests, through a natural chemistry, transformed into a Panacea in tar.

[2] *The Anatomy of Plants: with an Idea of the Philosophical History of Plants*, by Nehemiah Grew, M.D. London, 1682. See Bk. I. ch. 2. § 30. Grew (1628–1712) was secretary to the Royal Society, and an eminent English botanist of his day, author of works which laid the foundation of Vegetable Physiology. The microscope was then initiating important discoveries. Grew, Ray, and Malpighi, are the three great modern botanists before Linnæus.

vegetables. But, whether the discoverers have rightly guessed at all their uses or no, thus much is certain—that there are innumerable fine and curious parts in a vegetable body, and a wonderful similitude or analogy between the mechanism of plants and animals. And perhaps some will think it not unreasonable to suppose the mechanism of plants more curious than even that of animals, if we consider not only the several juices secreted by different parts of the same plant, but also the endless variety of juices drawn and formed out of the same soil, by various species of vegetables; which must therefore differ in an endless variety, as to the texture of their absorbent vessels and secretory ducts.

32. A body, therefore, either animal or vegetable, may be considered as an organised system of tubes and vessels, containing several sorts of fluids. And as fluids are moved through the vessels of animal bodies by the systole and diastole of the heart, the alternate expansion and condensation of the air, and the oscillations in the membranes and tunics of the vessels—even so, by means of air expanded and contracted in the tracheæ, or vessels made up of elastic fibres, the sap is propelled through the arterial tubes of a plant, and the vegetable juices, as they are rarefied by heat or condensed by cold, will either ascend and evaporate into air, or descend in the form of a gross liquor.

33. Juices, therefore, first purified by straining through the fine pores of the root, are afterwards exalted by the action of the air and the vessels of the plant; but, above all, by the action of the sun's light; which, at the same time that it heats, doth wonderfully rarefy and raise the sap, till it perspires and forms an atmosphere, like the effluvia of animal bodies. And, though the leaves are supposed to perform principally the office of lungs, breathing out excrementitious vapours, and drawing in alimentary; yet it seems probable, that the reciprocal actions of repulsion and attraction are performed all over the surface of vegetables as well as animals. In which reciprocation Hippocrates[1] supposeth the manner of nature's acting for the nourishment and health of animal bodies

[1] *Opera*, tom. I. pp. 629, &c. (ed. Lips. 1825)—in the treatise *De Diæta*.

chiefly to consist. And, indeed, what share of a plant's nourishment is drawn, through the leaves and bark, from that ambient heterogeneous fluid called air, is not easy to say. It seems very considerable, and altogether necessary, as well to vegetable as animal life.

34. It is an opinion received by many, that the sap circulates in plants as the blood in animals; that it ascends through capillary arteries in the trunk, into which are inosculated other vessels of the bark answering to veins, which bring back to the root the remainder of the sap, over and above what had been deposited during its ascent by the arterial vessels, and secreted for the several uses of the vegetable throughout all its parts, stem, branches, leaves, flowers, and fruit. Others deny this circulation, and affirm that the sap doth not return through the bark vessels. It is nevertheless agreed by all that there are ascending and descending juices; while some will have the ascent and descent to be a circulation of the same juices through different vessels; others will have the ascending juice to be one sort attracted by the root, and the descending another imbibed by the leaves, or extremities of the branches; lastly, others think that the same juice, as it is rarefied or condensed by heat or cold, rises and subsides in the same tube. I shall not take upon me to decide this controversy. Only I cannot help observing that the vulgar argument from analogy between plants and animals loses much of its force, if it be considered that the supposed circulating of the sap, from the root or lacteals through the arteries, and thence returning, by inosculations, through the veins or bark vessels to the root or lacteals again, is in no sort conformable or analogous to the circulation of the blood.

35. It is sufficient to observe, what all must acknowledge, that a plant or tree is a very nice and complicated machine (sect. 30, 31); by the several parts and motions whereof, the crude juices, admitted through the absorbent vessels, whether of the root, trunk, or branches, are variously mixed, separated, altered, digested, and exalted, in a very wonderful manner. The juice, as it passeth in and out, up and down, through tubes of different textures, shapes, and sizes, and is affected by the alternate compression and expansion of elastic vessels, by the vicissitudes of seasons,

the changes of weather, and the various action of the solar light, grows still more and more elaborate.

36. There is therefore no chemistry like that of nature, which addeth to the force of fire the most delicate, various, and artificial percolation (sect. 29). The incessant action of the sun upon the elements of air, earth, and water, and on all sorts of mixed bodies, animal, vegetable, and fossil, is supposed to perform all sorts of chemical operations. Whence it should follow, that the air contains all sorts of chemic productions, the vapours, fumes, oils, salts, and spirits of all the bodies we know: from which general aggregate or mass, those that are proper being drawn in, through the fine vessels of the leaves, branches, and stem of the tree, undergo, in its various organs, new alterations, secretions, and digestions, till such time as they assume the most elaborate form.

37. Nor is it to be wondered that the peculiar texture of each plant or tree, co-operating with the solar fire[1] and pre-existing juices, should so alter the fine nourishment drawn from earth and air (sect. 33), as to produce various specific qualities of great efficacy in medicine; especially if it be considered that in the opinion of learned men, there is an influence on plants derived from the sun, besides its mere heat. Certainly, Dr. Grew, that curious anatomist of plants, holds the solar influence[1] to differ from that of a mere culinary fire no otherwise than by being only a more temperate and equal heat.

38. The alimentary juice taken into the lacteals, [[2]if I may so say, of vegetables,] consists of oily, aqueous, and saline particles, which being dissolved, volatilised, and diversely agitated, part thereof is spent and exhaled into the air; and that part which remains is, by the economy of the plant, and action of the sun, strained, purified, concocted, and ripened, into an inspissated oil or balsam, and deposited in certain cells placed chiefly in the bark, which is thought to answer the *panniculus adiposus* in animals, defending trees from the weather, and, when in

[1] Cf. Berkeley's *First Letter to Thomas Prior, on the Virtues of Tar-water*, sect. 16, 17, where he professes 'the ancient opinion, that Fire is the animal spirit of the visible world.' See also Grew's *Idea of a Philosophical History of Plants*, § 61.

[2] 'whether of animals or vegetables'—in first edition.

sufficient quantity, rendering them evergreen. This balsam, weeping or sweating through the bark, hardens into resin; and this most copiously in the several species of pines and firs, whose oil being in greater quantity, and more tenacious of the acid spirit, or vegetable soul (as perhaps it may not improperly be called), abides the action of the sun, and, attracting the sunbeams, is thereby exalted and enriched, so as to become a most noble medicine: such is the last product of a tree, perfectly maturated by time and sun.

39. It is remarked by Theophrastus that all plants and trees while they put forth have most humour, but when they have ceased to germinate and bear, then the humour is strongest, and most sheweth the nature of the plant, and that, therefore, trees yielding resin should be cut after germination. It seems also very reasonable to suppose the juice of old trees, whose organs bring no new sap, should be better ripened than that of others.

40. The aromatic flavours of vegetables seem to depend upon the sun's light as much as colours[1]. As in the production of the latter, the reflecting powers of the object, so in that of the former, the attractive and organical powers of the plant co-operate with the sun (sect. 36, 37). And as from Sir Isaac Newton's experiments it appears that all colours are virtually in the white light of the sun, and shew themselves when the rays are separated by the attracting and repelling powers of objects—even so the specific qualities of the elaborate juices of plants seem to be virtually or eminently contained in the solar light, and are actually exhibited upon the separation of the rays, by the peculiar powers of the capillary organs in vegetables, attracting and imbibing certain rays, which produce certain flavours and qualities, in like manner as certain rays, being reflected, produce certain colours.

[1] This and the following sections discuss the already noted qualities of the juice of plants, especially pines and firs. The solar emanation contained in this, according to the 'fire philosophy' of *Siris*, constitutes the *soul* of vegetable life, and is to the Macrocosm what its animal spirit is to the microcosm. Sanitary properties of light are now universally recognised, alike in the case of animals and vegetables.

41. It hath been observed by some curious anatomists that the secretory vessels in the glands of animal bodies are lined with a fine down, which in different glands is of different colours. And it is thought that each particular down, being originally imbued with its own proper juice, attracts none but that sort; by which means so many various juices are secreted in different parts of the body. And perhaps there may be something analogous to this in the fine absorbent vessels of plants, which may co-operate towards producing that endless variety of juices, elaborated in plants from the same earth and air.

42. The balsam or essential oil of vegetables contains a spirit, wherein consist the specific qualities, the smell and taste, of the plant. Boerhaave[1] holds the native presiding spirit to be neither oil, salt, earth, or water; but somewhat too fine and subtle to be caught alone and rendered visible to the eye. This when suffered to fly off, for instance, from the oil of rosemary, leaves it destitute of all flavour. This spark of life, this spirit or soul, if we may so say, of the vegetable departs without any sensible diminution of the oil or water wherein it was lodged.

43. It should seem that the forms, souls, or principles of vegetable life subsist in the light or solar emanation (sect. 40); which in respect of the macrocosm is what the animal spirit is to the microcosm—the interior tegument, the subtle instrument and vehicle of power. No wonder, then, that the *ens primum* or *scintilla spirituosa*, as it is called, of plants should be a thing so fine and fugacious as to escape our nicest search. It is evident that nature at the sun's approach vegetates, and languishes at his recess; this terrestrial globe seeming only a matrix disposed and prepared to receive life from his light; whence Homer in his Hymns styleth earth the wife of heaven, ἄλοχ' οὐρανοῦ ἀστερόεντος.

44. The luminous spirit which is the form or life of a plant, from whence its differences and properties flow, is somewhat extremely volatile. It is not the oil, but a thing more subtle, whereof oil is the vehicle, which retains it from flying off, and is lodged in several parts of the plant, particularly in the cells of the bark and in the seeds.

[1] Boerhaave (1668–1738)—the most illustrious physician of the eighteenth century. See his *Elementa Chemiæ*, tom. II. pp. 149–50.

This oil, purified and exalted by the organical powers of the plant, and agitated by warmth, becomes a proper receptacle of the spirit: part of which spirit exhales through the leaves and flowers, and part is arrested by this unctuous humour that detains it in the plant. It is to be noted this essential oil, animated, as one may say, with the flavour of the plant, is very different from any spirit that can be procured from the same plant by fermentation.

45. Light impregnates air (sect. 37, 43), air impregnates vapour; and this becomes a watery juice by distillation, having risen first in the cold still with a kindly gentle heat. This fragrant vegetable water is possessed of the specific odour and taste of the plant. It is remarked that distilled oils added to water for counterfeiting the vegetable water can never equal it, artificial chemistry falling short of the natural.

46. The less violence is used to nature the better its produce. The juice of olives or grapes issuing by the lightest pressure is best. Resins that drop from the branches spontaneously, or ooze upon the slightest incision, are the finest and most fragrant. And infusions are observed to act more strongly than decoctions of plants; the more subtle and volatile salts and spirits, which might be lost or corrupted by the latter, being obtained in their natural state by the former. It is also observed that the finest, purest, and most volatile part is that which first ascends in distillation. And, indeed, it should seem the lightest and most active particles required least force to disengage them from the subject.

47. The salts, therefore, and more active spirits of the tar are got by infusion in cold water; but the resinous part is not to be dissolved thereby (sect. 7). Hence the prejudice which some perhaps may entertain against tar-water as a medicine, the use whereof might inflame the blood by its sulphur and resin, appears to be not well grounded; it being indeed impregnated with a fine acid spirit, balsamic, cooling, diuretic, and possessed of many other virtues (sect. 42, 44). Spirits are supposed to consist of salts and phlegm, probably, too, somewhat of a fine oily nature, differing from oil in that it mixeth with water, and agreeing with oil in that it runneth in rivulets by distillation. Thus much is allowed, that the water, earth, and

fixed salt are the same in all plants; that, therefore, which differenceth a plant, or makes it what it is—the *native spark* or *form*—in the language of the chemists or schools—is none of those things; nor yet the finest oil, which seemeth only its receptacle or vehicle. It is observed by chemists that all sorts of balsamic wood afford an acid spirit, which is the volatile oily salt of the vegetable; herein are chiefly contained their medicinal virtues; and, by the trials I have made, it appears that the acid spirit in tar-water possesseth the virtues, in an eminent degree, of that of *guaiacum*, and other medicinal woods.

48. Qualities in a degree too strong for human nature to subdue, and assimilate to itself must hurt the constitution. All acids, therefore, may not be useful or innocent. But this seemeth an acid so thoroughly concocted, so gentle, bland, and temperate, and withal a spirit so fine and volatile, as readily to enter the smallest vessels, and be assimilated with the utmost ease.

49. If any one were minded to dissolve some of the resin, together with the salt or spirit, he need only mix some spirit of wine with the water. But such an entire solution of resins and gums as to qualify them for entering and pervading the animal system, like the fine acid spirit that first flies off from the subject, is perhaps impossible to obtain. It is an apothegm of the chemists, derived from Helmont[1], that whoever can make myrrh soluble by the human body has the secret of prolonging his days: and Boerhaave[2] owns that there seems to be truth in this, from its resisting putrefaction. Now, this quality is as remarkable in tar, with which the ancients embalmed and preserved dead bodies. And though Boerhaave himself, and other chemists before him, have given methods for making solutions of myrrh, yet it is by means of alcohol which extracts only the inflammable parts. And it doth not seem that any solution of myrrh is impregnated with its salt or acid spirit. It may not, therefore, seem strange

[1] J. B. Van Helmont (1572-1644), probably the greatest chemist before Lavoisier. He strove to carry out the notions of Paracelsus, by whose writings he was attracted to chemistry and alchemy. The seat of the soul he placed in the stomach, offering as one reason for this, that when we hear bad news we lose our appetite for food. His works were edited by his son, F. M. Van Helmont.

[2] *Elementa Chemiæ*, tom. II. p. 231.

if this water should be found more beneficial for procuring health and long life than any solution of myrrh whatsoever.

50. Certainly divers resins and gums may have virtues, and yet not be able for their grossness to pass the lacteals and other finer vessels, nor yet, perhaps, readily impart those virtues to a menstruum that may with safety and speed convey them throughout the human body. Upon all which accounts, I believe tar-water will be found to have singular advantages. It is observed that acid spirits prove the stronger, by how much the greater degree of heat is required to raise them. And indeed there seemeth to be no acid more gentle than this, obtained by the simple affusion of cold water; which carries off from the subject the most light and subtle parts, and, if one may so speak, the very flower of its specific qualities. And here it is to be noted that the volatile salt and spirit of vegetables do, by gently stimulating the solids, attenuate the fluids contained in them, and promote secretions, and that they are penetrating and active, contrary to the general nature of other acids.

51. It is a great maxim for health, that the juices of the body be kept fluid in a due proportion. Therefore, the acid volatile spirit in tar-water, at once attenuating and cooling in a moderate degree, must greatly conduce to health, as a mild salutary deobstruent, quickening the circulation of the fluids without wounding the solids, thereby gently removing or preventing those obstructions which are the great and general cause of most chronical diseases; in this manner answering to the antihysterics, *assafœtida*, *galbanum*, myrrh, amber, and, in general, to all the resins and gums of trees or shrubs useful in nervous cases.

52. Warm water is itself a deobstruent. Therefore the infusion of tar drunk warm is easier insinuated into all the nice capillary vessels, and acts not only by virtue of the balsam, but also by that of the vehicle. Its taste, its diuretic quality, its being so great a cordial, shew the activity of this medicine. And, at the same time that it quickens the sluggish blood of the hysterical, its balsamic oily nature abates the too rapid motion of the sharp thin blood in those who are hectic. There is a lentor and smoothness in the blood of healthy strong people; on the contrary, there is often an acrimony and solution in that

of weakly morbid persons. The fine particles of tar are not only warm and active, they are also balsamic and emollient; softening and enriching the sharp and vapid blood, and healing the erosions occasioned thereby in the blood-vessels and glands.

53. Tar-water possesseth the stomachic and cardiac qualities of *elixir proprietatis*, Stoughton's drops, and many such tinctures and extracts; with this difference, that it worketh its effect more safely, as it hath nothing of that spirit of wine, which, however mixed and disguised, may yet be well accounted a poison in some degree.

54. Such medicines are supposed to be diaphoretic, which, being of an active and subtle nature, pass through the whole system, and work their effect in the finest capillaries and perspiratory ducts, which they gently cleanse and open. Tar-water is extremely well fitted to work by such an insensible diaphoresis, by the fineness and activity of its acid volatile spirit. And surely those parts ought to be very fine, which can scour the perspiratory ducts, under the scarf skin or cuticle, if it be true, that one grain of sand would cover the mouths of more than a hundred thousand.

55. Another way wherein tar-water operates is by urine, than which perhaps none is more safe and effectual, for cleansing the blood and carrying off its salts. But it seems to produce its principal effect as an alterative, sure and easy, much safer than those vehement, purgative, emetic, and salivating medicines, which do violence to nature.

56. An obstruction of some vessels causeth the blood to move more swiftly in other vessels which are not obstructed. Hence manifold disorders. A liquor that dilutes and attenuates resolves the concretions which obstruct. Tar-water is such a liquor. It may be said, indeed, of common water, that it attenuates; also of mercurial preparations, that they attenuate. But it should be considered that mere water only distends the vessels, and thereby weakens their tone; and that mercury by its great momentum may justly be suspected of hurting the fine capillaries, which two deobstruents therefore might easily overact their parts, and (by lessening the force of the elastic vessels) remotely produce those concretions they are intended to remove.

57. Weak and rigid fibres are looked on by the most able physicians, as sources of two different classes of distempers: a sluggish motion of the liquids occasioning weak fibres: therefore tar-water is good to strengthen them, as it gently accelerates their contents. On the other hand, being an unctuous, bland fluid, it moistens and softens the dry and stiff fibres, and so proves a remedy for both extremes.

58. Common soaps are compositions of lixivial salt and oil. The corrosive acrimony of the saline particles, being softened by the mixture of an unctuous substance, they insinuate themselves into the small ducts with less difficulty and danger. The combination of these different substances makes up a very subtle and active medicine, fitted for mixing with all humours, and resolving all obstructions. Soap, therefore, is justly esteemed a most efficacious medicine in many distempers. Alkaline soap is allowed to be cleansing, attenuating, opening, resolving, sweetening; it is pectoral, vulnerary, diuretic, and hath other good qualities which are also to be found in tar-water. It is granted that oil and acid salts combined together exist in vegetables, and that consequently there are acid soaps as well as alkaline. And the saponaceous nature of the acid vegetable spirits is what renders them so diuretic, sudorific, penetrating, abstersive, and resolving. Such, for instance, is the acid spirit of *guaiacum*. And all these same virtues seem to be in tar-water in a mild and salutary degree.

59. It is the general opinion that all acids coagulate the blood. Boerhaave[1] excepts vinegar, which he holds to be a soap, inasmuch as it is found to contain an oil as well as an acid spirit. Hence it is both unctuous and penetrating, a powerful antiphlogistic, and preservative against corruption and infection. Now it seems evident that tar-water is a soap as well as vinegar. For, though it be a character of resin, which is an inspissated gross oil, not to dissolve in water (sect. 47), yet the salts attract some fine particles of essential oil: which fine oil serves as a vehicle for the acid salts, and shews itself in the colour of the tar-water: for all pure salts are colourless. And,

[1] *Elementa Chemiæ*, tom. II. p. 216

though the resin will not dissolve in water, yet the subtle oil, in which the vegetable salts are lodged, may as well mix with water as vinegar doth, which contains both oil and salt. And, as the oil in tar-water discovers itself to the eye, so the acid salts do manifest themselves to the taste. Tar-water therefore is a soap, and as such hath the medicinal qualities of soap.

60. It operates more gently as the acid salts lose their acrimony, being sheathed in oil [1], and thereby approaching the nature of neutral salts, are more benign and friendly to the animal system: and more effectually, as, by the help of a volatile, smooth, insinuating oil, those same salts are more easily introduced into the capillary ducts. Therefore, in fevers and epidemical distempers it is (and I have found it so), as well as in chronical diseases, a most safe and efficacious medicine, being good against too great fluidity as a balsamic, and good against viscidity as a soap. There is something in the fiery corrosive nature of lixivial salts, which makes alkaline soap a dangerous remedy in all cases where an inflammation is apprehended. And, as inflammations are often occasioned by obstructions, it should seem an acid soap was much the safer deobstruent.

61. Even the best turpentines, however famous for their vulnerary and detergent qualities, have yet been observed by their warmth to dispose to inflammatory tumours. But the acid spirit (sect. 7, 8) being in so great proportion in tar-water, renders it a cooler and safer medicine. And the æthereal oil of turpentine, though an admirable dryer, healer, and anodyne, when outwardly applied to wounds and ulcers, and not less useful in cleansing the urinary passages and healing their ulcerations, yet is known to be of a nature so very relaxing as sometimes to do much mischief when taken inwardly. Tar-water is not attended with the same ill effects, which I believe are owing in a great measure to the æthereal oils being deprived of the acid spirit in distillation, which, vellicating and contracting as a stimulus, might have proved a counterpoise to the excessive lubricating and relaxing qualities of the oil.

[1] Cf. Berkeley's *Letter to Thomas Prior, on the Virtues of Tar-water in the Plague* (vol. III. p. 484)—especially the reference to Andrew Reid's *Letter to Dr. Hales.* Reid recommends that the medicinal acid should be freed from its oil.

62. Woods in decoction do not seem to yield so ripe and elaborate a juice, as that which is deposited in the cells or *loculi terebinthiaci*, and spontaneously oozes from them. And indeed, though the balsam of Peru, obtained by boiling wood and scumming the decoction, be a very valuable medicine, and of great account in divers cases, particularly asthmas, nephritic pains, nervous colics, and obstructions, yet I do verily think (and I do not say this without experience) that tar-water is a more efficacious remedy in all those cases than even that costly drug.

63. It hath been already observed that the restorative pectoral antihysterical virtues of the most precious balsams and gums are possessed in a high degree by tar-water (sect. 9, 21, 22, 23). And I do not know any purpose answered by the wood drinks for which tar-water may not be used with at least equal success. It contains the virtues even of *guaiacum*, which seems the most efficacious of all woods, warming and sweetening the humours, diaphoretic and useful in gouts, dropsies, and rheums, as well as in the foul disease. Nor should it seem strange if the virtues obtained by boiling an old dry wood prove inferior to those extracted from a balsam.

64. There is a fine volatile spirit in the waters of Geronster, the most esteemed of all the fountains about the Spa[1], but whose waters do not bear transporting. The stomachic, cardiac, and diuretic qualities of this fountain somewhat resemble those of tar-water, which, if I am not greatly mistaken, contains the virtues of the best chalybeat and sulphureous waters; with this difference, that those waters are apt to affect the head in taking, which tar-water is not. Besides, there is a regimen of diet to be observed, especially with chalybeat waters, which I never found necessary with this. Tar-water layeth under no restraint either as to diet, hours, or employment. A man may study, or exercise, or repose, keep his own hours, pass his time either within or without, and take wholesome nourishment of any kind.

65. The use of mineral waters, however excellent for the nerves and stomach, is often suspended by colds and

[1] The waters of Spa have perhaps been longer in repute than any in Europe. Only one of the springs is in Spa itself; the others are at some distance in the woods.

inflammatory disorders; in which they are acknowledged to be very dangerous: whereas tar-water is so far from hurting in those cases, or being discontinued on that account, that it greatly contributes to their cure (sect. 7).

66. Cordials, vulgarly so called, act immediately on the stomach, and by consent of nerves on the head. But medicines of an operation too fine and light to produce a sensible effect in the *primæ viæ* may, nevertheless, in their passage through the capillaries, operate on the sides of those small vessels, in such manner as to quicken their oscillations, and consequently the motion of their contents, producing, in issue and effect, all the benefits of a cordial much more lasting and salutary than those of [[1] distilled] spirits, which by their caustic and coagulating qualities do incomparably more mischief than good. Such a cardiac medicine is tar-water. The transient fits of mirth, produced from fermented liquors, [[2] and distilled spirits,] are attended with proportionable depression of spirit in their intervals. But the calm cheerfulness arising from this *water of health* (as it may be justly called) is permanent. In which it emulates the virtues of that famous plant Gen Seng[3], so much valued in China as the only cordial that raises the spirits without depressing them. Tar-water is so far from hurting the nerves, as common cordials do, that it is highly useful in cramps, spasms of the viscera, and paralytic numbness.

67. Emetics are on certain occasions administered with great success. But the overstraining and weakening of nature may be very justly apprehended from a course of emetics. They are nevertheless prescribed and substituted for exercise. But it is well remarked in Plato's *Timæus*[4] that vomits and purges are the worst exercise in the world. There is something in the mild operation of tar-water, that seems more friendly to the economy, and forwards the digestions and secretions in a way more

[1] 'Fermented' in first edition.

[2] Not in the early editions.

[3] Gen (Gin) Seng is the root of an Asiatic plant (*Panax Schin-Seng*). It had long been famous among the Chinese, as a stimulant and restorative. Eminent physicians in China have written volumes on its medicinal virtues, in a variety of diseases. Don, the botanist, says that the roots, which resemble the human form, enter into most medicines used by the Tartars and Chinese.

[4] P. 89.

natural and benign; the mildness of this medicine being such that I have known children take it, for above six months together, with great benefit, and without any inconvenience: and, after long and repeated experience, I do esteem it a most excellent diet-drink, fitted to all seasons and ages.

68. It is I think allowed that the origin of the gout lies in a faulty digestion. And it is remarked by the ablest physicians, that the gout is so difficult to cure, because heating medicines aggravate its immediate, and cooling its remote cause. But tar-water, although it contains active principles that strengthen the digestion beyond anything I know, and consequently must be highly useful, either to prevent or lessen the following fit, or by invigorating the blood to cast it upon the extremities, yet it is not of so heating a nature as to do harm even in the fit. Nothing is more difficult or disagreeable than to argue men out of their prejudices; I shall not therefore enter into controversies on this subject, but, if men dispute and object, shall leave the decision to time and trial.

69. In the modern practice, soap, opium, and mercury, bid fairest for Universal Medicines. The first of these is highly spoken of. But then those who magnify it most except against the use of it, in such cases where the obstruction is attended with a putrefactive alkali, or where an inflammatory disposition appears. It is acknowledged to be very dangerous in a phthisis, fever, and some other cases in which tar-water is not only safe but useful.

70. Opium, though a medicine of great extent and efficacy, yet is frequently known to produce grievous disorders in hysterical or hypochondriacal persons; who make a great part, perhaps the greatest, of those who lead sedentary lives in these islands. Besides, upon all constitutions dangerous errors may be committed in the use of opium.

71. Mercury hath of late years become a medicine of very general use—the extreme minuteness, mobility, and momentum of its parts rendering it a most powerful cleanser of all obstructions, even in the most minute capillaries[1]. But then we should be cautious in the use

[1] Mercury was much in vogue with the Arabian alchemists. Cf. sect. 194.

of it, if we consider that the very thing which gives it power of doing good above other deobstruents doth also dispose it to do mischief. I mean its great momentum, the weight of it being about ten times that of blood, and the momentum being the joint product of the weight and velocity, it must needs operate with great force; and may it not be justly feared that so great a force, entering the minutest vessels, and breaking the obstructed matter, might also break or wound the fine tender coats of those small vessels, and so bring on the untimely effects of old age, producing more, perhaps, and worse obstructions than those it removed? Similar consequences may justly be apprehended from other mineral and ponderous medicines. Therefore, upon the whole, there will not perhaps be found any medicine more general in its use, or more salutary in its effects, than tar-water.

72. To suppose that all distempers, arising from very different, and it may be from contrary causes[1], can be cured by one and the same medicine must seem chimerical[2]. But it may with truth be affirmed, that the virtue of tar-water extends to a surprising variety of cases, very distant and unlike (sect. 3, 4, 5, 6, 21, &c.). This I have experienced in my neighbours, my family, and myself. And, as I live in a remote corner[3], among poor neighbours, who for want of a regular physician have often recourse to me, I have had frequent opportunities of trial, which convince me it is of so just a temperament as to be an enemy to all extremes. I have known it to do great good in a cold, watery constitution, as a cardiac and stomachic: and at the same time allay heat and feverish thirst in another. I have known it correct costive habits in some, and the contrary habit in others. Nor will this seem incredible if it be considered that middle qualities naturally reduce the extreme. Warm water, for instance, mixed with hot and cold, will lessen the heat in that, and the cold in this.

[1] 'causes,' i. e. physical or dependent causes, with which alone he is concerned in this part of *Siris*.

[2] Cf. the definition of Panacea, in Berkeley's *First Letter to Thomas Prior*, sect. 12. It was Berkeley's opinion, that tar-water may even be a Panacea or universal medicine, that chiefly excited the faculty against *Siris*.

[3] Cloyne.

73. They who know the great virtues of common soap, whose coarse lixivial salts are the product of culinary fire, will not think it incredible that virtues of mighty force and extent should be found in a fine acid soap (sect. 58), the salts and oil whereof are a most elaborate product of nature and the solar light.

74. It is certain tar-water warms, and therefore some may perhaps still think it cannot cool. The more effectually to remove this prejudice, let it be farther considered that as, on the one hand, opposite causes do sometimes produce the same effect, for instance, heat by rarefaction and cold by condensation do both increase the air's elasticity; so, on the other hand, the same cause shall sometimes produce opposite effects: heat for instance [[1] thins, and again heat coagulates] the blood. It is not therefore strange, that tar-water should warm one habit and cool another, have one good effect on a cold constitution, and another good effect on an inflamed one; nor, if this be so, that it should cure opposite disorders. All which justifies to reason what I have often found true in fact. The salts, the spirits, the heat of tar-water are of a temperature congenial to the constitution of a man, which receives from it a kindly warmth, but no inflaming heat. It was remarkable that two children in my neighbourhood, being in a course of tar-water, upon an intermission of it, never failed to have their issues inflamed by a humour much more hot and sharp than at other times. But its great use in the small-pox, pleurisies, and fevers is a sufficient proof that tar-water is not of an inflaming nature.

75. I have dwelt the longer on this head, because some gentlemen of the faculty have thought fit to declare that tar-water must inflame, and that they would never visit any patient in a fever who had been a drinker of it[2]. But I will venture to affirm, that it is so far from increasing a feverish inflammation, that it is on the contrary a most ready means to allay and extinguish it. It is of admirable use in fevers, being at the same time the surest, safest and most effectual, both paregoric and cordial: for the truth of which I appeal to any person's experience who shall

[1] 'In one degree thins, and in another coagulates'—in first edition.
[2] Cf. sect. 7.

take a large draught of it milk warm in the paroxysm of a fever, even when plain water or herb-teas shall be found to have little or no effect. To me it seems that its singular and surprising use in fevers of all kinds, were there nothing else, would be alone sufficient to recommend it to the public.

76. The best physicians make the idea of a fever to consist in a too great velocity of the heart's motion, and too great resistance at the capillaries. Tar-water, as it softens and gently stimulates those nice vessels, helps to propel their contents, and so contributes to remove the latter part of the disorder. And for the former, the irritating acrimony which accelerates the motion of the heart is diluted by watery, corrected by acid, and softened by balsamic remedies, all which intentions are answered by this aqueous, acid, balsamic medicine. Besides, the viscid juices coagulated by the febrile heat are resolved by tar-water as a soap, and not too far resolved, as it is a gentle acid soap; to which we may add, that the peccant humours and salts are carried off by its diaphoretic and diuretic qualities.

77. I found all this confirmed by my own experience in the late sickly season of the year one thousand seven hundred and forty-one, having had twenty-five fevers in my own family cured by this medicinal water, drunk copiously[1]. The same method was practised on several of my poor neighbours with equal success. It suddenly calmed the feverish anxieties, and seemed every glass to refresh, and infuse life and spirit into the patient. At first some of these patients had been vomited, but afterwards I found that without vomiting, bleeding, blistering, or any other evacuation or medicine whatever, very bad fevers could be cured by the sole drinking of tar-water, milk warm, and in good quantity, perhaps a large glass every hour [[2] or oftener] taken in bed. And it was remarkable that such as were cured by this comfortable cordial recovered health and spirits at once, while those who had been cured by evacuations often languished long, even after the fever had left them, before they could recover of their medicines and regain their strength.

[1] Cf. Berkeley's letters to Thomas Prior, in February and May, 1741, in my *Life and Letters of Berkeley*.

[2] Not in the early editions.

78. In peripneumonies and pleurisies I have observed tar-water to be excellent, having known some pleuritic persons cured without bleeding, by a blister early applied to the stitch, and the copious drinking of tar-water, four or five quarts, or even more in four-and-twenty hours. And I do recommend it to farther trial, whether in all cases of a pleurisy, one moderate bleeding, a blister on the spot, and plenty of tepid tar-water may not suffice, without those repeated and immoderate bleedings, the bad effects of which are perhaps never got over. I do even suspect that a pleuritic patient betaking himself to bed betimes, and drinking very copiously of tar-water, may be cured by that alone, without bleeding, blistering, or any other medicine whatsoever: certainly I have found this succeed at a glass every half hour.

79. I have known a bloody flux of long continuance, after divers medicines had been tried in vain, cured by tar-water[1]. But that which I take to be the most speedy and effectual remedy in a bloody flux is a clyster of an ounce of common brown resin dissolved over a fire in two ounces of oil, and added to a pint of broth, which not long since I had frequent occasion of trying when that distemper was epidemical. Nor can I say that any to whom I advised it miscarried. This experiment I was led to make by the opinion I had of tar as a balsamic: and resin is only tar inspissated.

80. Nothing that I know corroborates the stomach so much as tar-water (sect. 68). Whence it follows, that it must be of singular use to persons afflicted with the gout. And, from what I have observed in five or six instances, I do verily believe it the best and safest medicine either to prevent the gout, or so to strengthen nature against the fit, as to drive it from the vitals. Dr. Sydenham, in his *Treatise of the Gout*[2], declares that whoever finds a medicine the most efficacious for strengthening digestion will do more service in the cure of that and other chronical distempers than he can even form a notion of. And I leave

[1] Cf. letter to Prior, Feb. 8, 1741.

[2] *Tractatus de Podagra* (see sect. 29, 40), by Sydenham (1624–1689), the friend of Locke and Boyle, and the greatest English physician of the seventeenth century. He was himself a martyr to gout.

it to trial, whether tar-water be not that medicine, as I myself am persuaded it is, by all the experiments I could make. But in all trials I would recommend discretion; for instance, a man with the gout in his stomach ought not to drink cold tar-water. This Essay leaves room for future experiment in every part of it, not pretending to be a complete treatise.

81. It is evident to sense that blood, urine, and other animal juices, being let to stand, soon contract a great acrimony. Juices, therefore, from a bad digestion retained, and stagnating in the body, grow sharp and putrid. Hence a fermenting heat, the immediate cause of the gout. The curing this by cooling medicines, as they would increase the antecedent cause, must be a vain attempt. On the other hand, spices and spirituous liquors, while they contribute to remove the antecedent cause or bad digestion, would, by inflaming the blood, increase the proximate or immediate cause of the gout, to wit, the fermenting heat. The scope therefore must be, to find a medicine that shall corroborate but not inflame. Bitter herbs are recommended; but they are weak in comparison of tar-water.

82. The great force of tar-water to correct the acrimony of the blood appears in nothing more than in the cure of a gangrene from an internal cause; which was performed on a servant of my own, by prescribing the copious and constant use of tar-water for a few weeks. From my representing tar-water as good for so many things, some perhaps may conclude it is good for nothing. But charity obligeth me to say what I know, and what I think, howsoever it may be taken. Men may censure and object as they please, but I appeal to time and experiment. Effects misimputed, cases wrong told, circumstances overlooked, perhaps, too, prejudices and partialities against truth, may for a time prevail, and keep her at the bottom of her well, from whence nevertheless she emergeth sooner or later, and strikes the eyes of all those who do not keep them shut [1].

83. Boerhaave [2] thinks a specific may be found for that

[1] Cf. sect. 367-68.

[2] See his *Aphorismi de Cognoscendis et Curandis Morbis* (1708), aph. 1390, 1391; also his *Praxis Medica* (1728)—'De Variolis,' pp. 297-320. Cf. Berkeley's *Further Thoughts on Tar-water.*

peculiar venom which infects the blood in the small-pox, and that the prospect of so great a public benefit should stir up men to search for it. Its wonderful success in preventing and mitigating that distemper (sect. 2, 3) would incline one to suspect that tar-water is such a specific [[1] especially since I have found it of sovereign use as well during the small-pox as before it]. Some think an erysipelas and the plague differ only in degree. If so, tar-water should be useful in the plague, for I have known it cure an erysipelas.

84. Tar-water, as cleansing, healing, and balsamic, is good in all disorders of the urinary passages, whether obstructed or ulcerated. Dr. Lister[2] supposeth, indeed, that turpentines act by a caustic quality, which irritates the coats of the urinary ducts to expel sand or gravel. But it should seem this expelling diuretic virtue consisted rather in the salts than the resin, and consequently resides in the tar-water, gently stimulating by its salts, without the dangerous force of a caustic. The violent operation of ipecacuanha lies in its resin, but the saline extract is a gentle purge and diuretic, by the stimulus of its salts.

85. That which acts as a mild cordial (sect. 66), neither hurting the capillary vessels as a caustic, nor affecting the nerves, nor coagulating the juices, must in all cases be a friend to nature, and assist the *vis vitæ* in its struggle against all kinds of contagion. And from what I have observed, tar-water appears to me a useful preservative in all epidemical disorders, and against all other infection whatsoever, as well as that of the small-pox. What effects the *animi pathemata* have in human maladies is well known, and consequently the general benefit of such a cardiac [[3] may be reasonably supposed].

86. [4] As the body is said to clothe the soul, so the nerves

[1] Added in second edition.

[2] Martin Lister (1638–1712), an English physician, frequent contributor to the *Philos. Trans.*, and author of works in natural history and anatomy of repute in their day. His *Journey to Paris* (1698) was parodied by Dr. King in his *Journey to London*. Dr. Lister was a benefactor to the Ashmolean Museum.

[3] 'Cannot be doubted'—in first edition.

[4] In sect. 86–119 we have an account of the utility of tar-water in nervous diseases, indigestion,

may be said to constitute her inner garment[1]. And, as the soul animates the whole, what nearly touches the soul relates to all. Therefore the asperity of tartarous salts, and the fiery acrimony of alkaline salts, irritating and wounding the nerves, produce nascent passions and anxieties in the soul; which both aggravate distempers, and render men's lives restless and wretched, even when they are afflicted with no apparent distemper. This is the latent spring of much woe, spleen, and *tædium vitæ*. Small imperceptible irritations of the minutest fibres or filaments, caused by the pungent salts of wines and sauces, do so shake and disturb the microcosms of high livers, as often to raise tempests in courts and senates. Whereas the gentle vibrations that are raised in the nerves, by a fine subtle acid, sheathed in a smooth volatile oil (sect. 59, 61), softly stimulating and bracing the nervous vessels and fibres, promote a due circulation and secretion of the animal juices, and create a calm satisfied sense of health. And, accordingly, I have often known tar-water procure sleep and compose the spirits in cruel vigils, occasioned either by sickness or by too intense application of mind.

87. In diseases sometimes accidents happen from without by mismanagement, sometimes latent causes operate within, jointly with the specific taint or peculiar cause of the malady. The causes of distempers are often complicated, and there may be something in the idiosyncrasy of the patient that puzzles the physician. It may therefore be presumed that no medicine is infallible, not even in any one disorder. But, as tar-water possesseth the virtues of fortifying the stomach, as well as purifying and invigorating the blood, beyond any medicine that I know, it may be presumed of great and general efficacy in all those numerous illnesses which take their rise from foul or vapid blood, or from a bad digestion. The animal spirits are elaborated from the blood. Such therefore as the blood is, such will be the animal spirits, more or less, weaker or stronger. This sheweth the usefulness of tar-water in all hysteric and hypochondriac cases: which, together with

and scurvy, with an eloquent announcement of its advantages to the studious.

[1] Elsewhere Berkeley speaks of the body, including the nerves, as contained in percipient mind. The two modes of statement are easily reconcileable.

the maladies from indigestion, comprise almost the whole tribe of chronical diseases.

88. The *scurvy* may be reckoned in these climates a universal malady, as people in general are subject to it, and as it mixes more or less in almost all diseases. Whether this proceeds from want of elasticity in our air, upon which the tone of the vessels depends, and upon that the several secretions; or whether it proceeds from the moisture of our climate, or the grossness of our food, or the salts in our atmosphere, or from all these together—thus much at least seems not absurd to suppose, that as physicians in Spain and Italy are apt to suspect the venereal taint to be a latent principle, and bear a part in every illness, so far, as good reason, the scurvy should be considered by our physicians as having some share in most disorders and constitutions that fall in their way. It is certain our perspiration is not so free as in clearer air and warmer climates. Perspirable humours not discharged will stagnate and putrefy. A diet of animal food will be apt to render the juices of our bodies alkalescent. Hence ichorous and corrosive humours and many disorders. Moist air makes viscid blood; and saline air inflames this viscid blood. Hence broken capillaries, extravasated blood, spots, and ulcers, and other scorbutic symptoms. The body of a man attracts and imbibes the moisture and salts of the air and whatever floats in the atmosphere, which as it is common to all, so it affects all more or less.

89. Doctor Musgrave[1] thinks the Devonshire scurvy a relic of the leprosy, and that it is not owing to the qualities of the air. But, as these insulars in general live in a gross saline air, and their vessels being less elastic are consequently less able to subdue and cast off what their bodies as sponges draw in, one would be tempted to suspect the air not a little concerned, especially in such a situation as that of Devonshire. In all these British islands we enjoy a great mediocrity of climate; the effect whereof is, that we have neither heat enough to exalt and

[1] William Musgrave (1655–1721), an eminent physician, Secretary to the Royal Society. He settled at Exeter in 1621, and practised there for thirty years with high reputation. See Munk's *Roll of the Royal College of Physicians of London* (pp. 446–448) for an interesting account of Musgrave and his works.

dissipate the gross vapours, as in Italy, nor cold enough to condense and precipitate them, as in Sweden. So they are left floating in the air, which we constantly breathe, and imbibe through the whole surface of our bodies. And this, together with exhalations from coal fires, and the various fossils wherein we abound, doth greatly contribute to render us scorbutic and hypochondriac.

90. There are some who derive all diseases from the scurvy, which indeed must be allowed to create or mimic most other maladies. Boerhaave[1] tells us, it produceth pleuritic colic, nephritic, hepatic pains, various fevers, hot, malignant, intermitting dysenteries, faintings, anxieties, dropsies, consumptions, convulsions, palsies, fluxes of blood. In a word, it may be said to contain the seeds and origin of almost all distempers. Insomuch that a medicine which cures all sorts of scurvy may be presumed good for most maladies.

91. The scurvy doth not only in variety of symptoms imitate most distempers, but also, when come to a height, in degree of virulence equal the most malignant. Of this we have a remarkable proof in that horrible description of the scorbutic patients in the hospitals of Paris, given by Monsieur Poupart[2], in the *Memoirs of the Royal Academy of Sciences*, for the year 1699. That author thinks he saw some resemblance in it to the plague of Athens[3]. It is hard to imagine anything more dreadful than the case of those men, rotting alive by scurvy in its supreme degree. To obviate such putrefaction, I believe the most effectual method would be, to embalm (if one may so say) the living body with tar-water copiously drunk; and this belief is not without experience.

92. It is the received opinion that the animal salts of a sound body are of a neutral, bland, and benign nature: that is, the salts in the juices past the *primæ viæ* are neither acid or alkaline, having been subdued by the constitution,

[1] *Praxis Medica*—'De Scorbuto,' tom. V. pp. 101–17.

[2] Francis Poupart (1661–1709), the French anatomist, and member of the Academy, was a frequent contributor, especially on comparative anatomy, to the *Journal des Savans*, and the *Mémoires de l'Académie*. The paper referred to—*Étranges Effets du Scorbut arrivez à Paris en* 1699—appeared in the *Mémoires* in November of that year. It is also contained in the *Philos. Trans.* No. 318.

[3] Lucretius, *De Rerum Nat.* VI. 1136–1284.

and changed into a third nature. Where the constitution wants force to do this, the aliment is not duly assimilated: and, so far as the salts retain their pristine qualities, sickly symptoms ensue, acids and alkalies not perfectly subdued producing weak ferments in the juices. Hence scurvy, cachexy, and a long train of ills.

93. A cachexy or ill habit is much of the same kind with the scurvy, proceeds from the same causes, and is attended with like symptoms, which are so manifold and various, that the scurvy may well be looked on as a general cachexy, infecting the whole habit, and vitiating all the digestions. Some have reckoned as many sorts of the scurvy as there are taints of the blood. Others have supposed it a collection of all illnesses together. Some suppose it an accumulation of several diseases *in fieri*. Others take it for an assemblage of the relics of old distempers.

94. But thus much is certain, the cure of the scurvy is no more to be attempted by strongly active medicines, than (to use the similitude of an ingenious writer) a thorn in the flesh, or pitch on silk, to be removed by force. The viscid humour must be gently resolved and diluted, the tone of the vessels recovered by a moderate stimulation, and the tender fibres and capillary vessels gradually cleared from the concreted stuff that adheres and obstructs them. All which is in the aptest manner performed by a watery diluent, containing a fine vegetable soap. And although a complete cure by alteratives, operating on the small capillaries, and by insensible discharges, must require length of time, yet the good effect of this medicine on cachectic and scorbutic persons is soon perceived, by the change it produceth in their pale discoloured looks, giving a florid healthy countenance in less time than perhaps any other medicine.

95. It is supposed by physicians that the immediate cause of the scurvy lies in the blood, the fibrous part of which is too thick and the serum too thin and sharp; and that hence ariseth the great difficulty in the cure, because in the correcting of one part regard must be had to the other. It is well known how extremely difficult it is to cure an inveterate scurvy: how many scorbutic patients have grown worse by an injudicious course of evacuations: how many are even rendered incurable by the treatment of

inconsiderate physicians; and how difficult, tedious, and uncertain, the cure is in the hands even of the best, who are obliged to use such variety and change of medicines, in the different stages of that malady: which nevertheless may be cured (if I may judge by what I have experienced) by the sole, regular, constant, copious use of tar-water.

96. Tar-water moderately inspissates with its balsamic virtue, and renders mild the thin and sharp part of the blood, the same as a soapy medicine dissolves the grumous concretions of the fibrous part. As a balsam it destroys the ulcerous acrimony of the humours, and as a deobstruent it opens and cleans the vessels, restores their tone, and strengthens the digestion, whose defects are the principal cause of scurvy and cachexy.

97. In the cure of the scurvy the principal aim is to subdue the acrimony of the blood and juices. But, as this acrimony proceeds from different causes, or even opposite, as acid and alkaline, what is good in one sort of scurvy proves dangerous or even mortal in another. It is well known that hot antiscorbutics, where the juices of the body are alkalescent, increase the disease. And sour fruits and vegetables produce a like effect in the scurvy, caused by an acid acrimony. Hence fatal blunders are committed by unwary practitioners, who, not distinguishing the nature of the disease, do frequently aggravate instead of curing it. If I may trust what trials I have been able to make, this water is good in the several kinds of scurvy, acid, alkaline, and muriatic, and I believe it the only medicine that cures them all without doing hurt to any. As it contains a volatile acid (sect. 7) with a fine volatile oil, why may not a medicine cool in one part and warm in another be a remedy to either extreme (sect. 72)? I have observed it to produce a kindly genial warmth without heat, a thing to be aimed at in all sorts of scurvy. Besides, the balsam in tar-water sheathes all scorbutic salts alike: and its great virtues as a digester and deobstruent are of general use in all scorbutic, and I may add, in all chronical cases whatsoever.

98. I cannot be sure that I have tried it in a scrofulous case, though I have tried it successfully in one that I suspected to be so. And I apprehend it would be very

serviceable in such disorders. For although Dr. Gibbs in his treatise on the *King's Evil*[1] derives that disease from a coagulating acid, which is also agreeable to the opinion of some other physicians, and although tar-water contain an acid, yet, as it is a soap (sect. 58), it resolves instead of coagulating the juices of the body.

99. For hysterical and hypochondriacal disorders so frequent among us, it is commonly supposed that all acids are bad. But I will venture to except the acid soap of tar-water, having found by my own experience and that of many others, that it raises the spirits, and is an excellent anti-hysteric, nor less innocent than potent, which cannot be said of those others in common use, that often leave people worse than they found them.

100. In a high degree of scurvy a mercurial salivation is looked on by many as the only cure; which, by the vehement shock it gives the whole frame, and the sensible secretion it produceth, may be thought more adequate to such an effect. But the disorder occasioned by that violent process, it is to be feared, may never be got over. The immediate danger, the frequent bad effects, the extreme trouble and nice care attending such a course, do very deservedly make people afraid of it. And though the sensible secretion therein be so great, yet in a longer tract of time the use of tar-water may produce as great a discharge of scorbutic salts by urine and by perspiration—the effect of which last, though not so sensible, may yet be greater than that of salivation; especially if it be true that in common life insensible perspiration is to nutrition, and all sensible excretions, as five to three.

101. Many hysteric and scorbutic ailments, many taints contracted by themselves, or inherited from their ancestors, afflict the people of condition in these islands, often rendering them, upon the whole, much more unhappy than those whom poverty and labour have ranked in the lowest lot of life, which ailments might be safely removed or relieved by the sole use of tar-water; and those lives which seem hardly worth living for bad appetite, low spirits, restless nights, wasting pains and anxieties, be rendered easy and comfortable.

[1] *Observations of Various Cases of Scrophulous Disorder, commonly called the King's Evil.* (London, 1702.)

102. As the nerves are instruments of sensation, it follows that spasms in the nerves may produce all symptoms, and therefore a disorder in the nervous system shall imitate all distempers, and occasion, in appearance, an asthma for instance, a pleurisy, or a fit of the stone. Now, whatever is good for the nerves in general is good against all such symptoms. But tar-water, as it includes in an eminent degree the virtues of warm gums and resins, is of great use for comforting and strengthening the nerves (sect. 86), curing twitches in the nervous fibres, cramps also, and numbness in the limbs, removing anxieties, and promoting sleep: in all which cases I have known it very successful.

103. This safe and cheap medicine suits all circumstances and all constitutions, operating easily, curing without disturbing, raising the spirits without depressing them, a circumstance that deserves repeated attention: especially in these climates, where strong liquors so fatally and so frequently produce those very distresses they are designed to remedy; and, if I am not misinformed, even among the ladies themselves, who are truly much to be pitied[1]. Their condition of life makes them a prey to imaginary woes, which never fail to grow up in minds unexercised and unemployed. To get rid of these, it is said, there are who betake themselves to distilled spirits. And it is not improbable they are led gradually to the use of those poisons by a certain complaisant pharmacy, too much used in the modern practice, palsy drops, poppy cordial, plague water, and such like, which being in truth nothing but drams disguised, yet, coming from the apothecaries, are considered only as medicines.

104. The soul of man was supposed by many ancient sages to be thrust into the human body as into a prison, for punishment of past offences. But the worst prison is the body of an indolent epicure, whose blood is inflamed by fermented liquors (sect. 66) and high sauces, or rendered putrid, sharp, and corrosive, by a stagnation of the animal juices through sloth and indolence; whose membranes are irritated by pungent salts; whose mind is agitated by painful oscillations of the nervous system (sect. 86), and

[1] Note what is said of the prevalence, causes, and stringent cure of drunkenness, in sect. 103-109.

whose nerves are mutually affected by the irregular passions of his mind. This ferment in the animal economy darkens and confounds the intellect. It produceth vain terrors and vain conceits, and stimulates the soul with mad desires, which, not being natural, nothing in nature can satisfy. No wonder, therefore, there are so many fine persons of both sexes, shining themselves, and shone on by fortune, who are inwardly miserable and sick of life.

105. The hardness of stubbed vulgar constitutions renders them insensible of a thousand things that fret and gall those delicate people, who, as if their skin was peeled off, feel to the quick everything that touches them. The remedy for this exquisite and painful sensibility is commonly sought from fermented, perhaps from distilled, liquors, which render many lives wretched that would otherwise have been only ridiculous. The tender nerves and low spirits of such poor creatures would be much relieved by the use of tar-water, which might prolong and cheer their lives. I do therefore recommend to them the use of a cordial, not only safe and innocent, but giving health and spirits as surely as other cordials destroy them.

106. I do verily think there is not any other medicine whatsoever so effectual to restore a crazy constitution, and cheer a dreary mind, or so likely to subvert that gloomy empire of the spleen (sect. 103) which tyrannizeth over the better sort (as they are called) of these free nations; and maketh them, in spite of their liberty and property, more wretched slaves than even the subjects of absolute power, who breathe clear air in a sunny climate[1]. While men of low degree often enjoy a tranquillity and content that no advantage of birth or fortune can equal. Such, indeed, was the case while the rich alone could afford to be debauched; but when even beggars became debauchees, the case was altered.

107. The public virtue and spirit of the British legislature never shewed itself more conspicuous in any act than in that for suppressing the immoderate use of [[2]distilled spirits] among the people, whose strength and numbers constitute the true wealth of a nation: though evasive arts

[1] Cf. *Alciphron*, Dial. II. sect. 17.

[2] 'spirituous liquors'—in the early editions.

will, it is feared, prevail so long as distilled spirits of any kind are allowed, the character of Englishmen in general being that of Brutus, *Quicquid vult, valde vult.* But why should such a canker be tolerated in the vitals of a state, under any pretence or in any shape whatsoever? Better by far the whole present set of distillers were pensioners of the public, and their trade abolished by law; since all the benefit thereof put together would not balance the hundredth part of its mischief.

108. To prove the destructive effects of such spirits with regard both to the human species and individuals, we need not go so far as our Colonies, or the savage natives of America. Plain proof may be had nearer home. For, albeit there is in every town or district throughout England some tough dram-drinker, set up as the devil's decoy, to draw in proselytes; yet the ruined health and morals, and the beggary of such numbers, evidently shew that we need no other enemy to complete our destruction, than this cheap luxury at the lower end of the state, and that a nation lighted up at both ends must soon be consumed.

109. It is much to be lamented that our insulars, who act and think so much for themselves, should yet, from grossness of air and diet, grow stupid or dote sooner than other people, who by virtue of elastic air, water drinking, and light food, preserve their faculties to extreme old age; an advantage which may perhaps be approached, if not equalled, even in these regions, by tar-water, temperance, and early hours. The last is a sure addition to life, not only in regard of time, which, being taken from sleep, the image of death [1], is added to the waking hours, but also in regard of longevity and duration in the vulgar sense. I may say too in regard of spirit and vivacity, which, within the same compass of duration, may truly and properly be affirmed to add to man's life: it being manifest, that one man, by a brisker motion of his spirits and succession of his ideas, shall live more in one hour than another in two: and that the quantity of life is to be

[1] So Shelley in *Queen Mab*—

'How wonderful is Death,
Death and his brother Sleep!
One, pale as yonder waning moon,
With lips of lurid blue;
The other, rosy as the morn
When throned on ocean's wave,
It blushes o'er the world:
Yet both so passing wonderful!'

estimated, not merely from the duration, but also from the intenseness of living. Which intense living, or, if I may so say, lively life, is not more promoted by early hours as a regimen, than by tar-water as a cordial; which acts, not only as a slow medicine, but hath also an immediate and cheerful effect on the spirits (sect. 66).

110. It must be owned, the light attracted, secreted, and detained in tar (sect. 8, 29, 40), and afterwards drawn off in its finest balsamic particles, by the gentle menstruum of cold water, is not a violent and sudden medicine, always to produce its effect at once (such, by irritating, often do more mischief than good), but a safe and mild alterative, which penetrates the whole system, opens, heals, and strengthens the remote vessels, alters and propels their contents, and enters the minutest capillaries, and cannot therefore, otherwise than by degrees and in time, work a radical cure of chronic distempers. It gives nevertheless speedy relief in most cases, as I have found by myself and many others. I have been surprised to see persons fallen away and languishing under a bad digestion, after a few weeks recover a good stomach, and with it flesh and strength, so as to seem renewed, by the drinking of tar-water. The strength and quantity of this water to be taken by each individual person is best determined from experience. And as for the time of taking, I never knew any evil ensue from its being continued ever so long; but, on the contrary, many and great advantages, which sometimes would not perhaps begin to shew themselves till it had been taken two or three months.

111. We learn from Pliny that in the first ferment of new wine or *mustum*, the ancients were wont to sprinkle it with powdered resin, which gave it a certain sprightliness, *quædam saporis acumina*. This was esteemed a great improver of its odour and taste, and was, I doubt not, of its salubrity also. The brown old resin, that is to say hardened tar, as being more easily pulverized and sifted, was most in request for this purpose. They used likewise to season their wine vessels with pitch or resin. And I make no doubt that if our vintners would contrive to medicate their wines with the same ingredients, they might improve and preserve them with less trouble and expense to themselves, and less danger to others. He that would

know more particulars of this matter may consult Pliny and Columella[1]. I shall only add, that I doubt not a similar improvement may be made of malt liquor.

112. The ῥητίνη of Theophrastus and *resina* of Pliny are sometimes used in a general sense, to signify all sorts of oily viscid exudations from plants or trees. The crude watery juice that riseth early in the spring is gradually ripened and inspissated by the solar heat, becoming in orderly succession with the seasons an oil, a balsam, and at last a resin. And it is observed by chemists that turpentine dissolved over a gentle fire is, by the constant operation of heat, successively transformed into oil, balsam, pitch, and hard friable resin, which will incorporate with oil or rectified spirit, but not with water.

113. Sir John Floyer[2] remarks, that we want a method for the use of turpentine: and again, he who shall hit, saith he, on the pleasantest method of giving turpentine will do great cures in the gout, stone, catarrhs, dropsies, and cold scurvies, rheumatisms, ulcers, and obstructions of the glands. Lastly, he subjoins, that, for the use of altering and amending the juices and fibres, it must be given frequently, and in such small quantities at a time, and in so commodious a manner, as will agree best with the stomach (sect. 9), stay longest in the body, and not purge itself off; for large doses (saith he) go through too quick, and besides offend the head. Now, the infusion of tar or turpentine in cold water seems to supply the very method that was wanted, as it leaves the more unctuous and gross parts behind (sect. 47), which might offend the stomach, intestines, and head; and, as it may be easily taken, and as often, and in such quantity and such degree of strength, as suits the case of the patient. Nor should it seem that the fine spirit and volatile oil, obtained by infusion of tar (sect. 7, 42, 58), is inferior to that of turpentine, to which it superadds the virtue of wood soot,

[1] See Pliny, *Hist. Nat.* Lib. XIV. c. 25; and Columella, *De Re Rustica*, Lib. XII. c. 23, 24.

[2] Sir John Floyer (1649–1734), an eminent English physician. See his *Touchstone of Medicines* (1687), Pt. III. He brought the cold bath into fashion in his generation, and 'rode his hobby so hard as to attribute the prevalence of rickets in England, at the time he wrote (about 1700), to the abandonment of total immersion in baptism.' See Macpherson's *Baths and Wells of Europe*, p. 53.

which is known to be very great with respect to the head and nerves; and this appears evident from the manner of obtaining tar (sect. 13). And as the fine volatile parts of tar or turpentine are drawn off by infusion in cold water, and easily conveyed throughout the whole system of the human body; so it should seem the same method may be used with all sorts of balsams or resins whatsoever, as the readiest, easiest, and most inoffensive, as well as in many cases the most effectual way of obtaining and imparting their virtues.

114. After having said so much of the uses of tar, I must further add that, being rubbed on them, it is an excellent preservative of the teeth and gums: [[1]that it sweetens the breath, and] that it clears and strengthens the voice. And, as its effects are various and useful, so there is nothing to be feared from the operation of an alterative so mild and friendly to nature. It was a wise maxim of certain ancient philosophers, that diseases ought not to be irritated by medicines (sect. 103). But no medicine disturbs the animal economy less than this, which, if I may trust my own experience, never produces any disorder in a patient when rightly taken.

115. I knew indeed a person who took a large glass of tar-water just before breakfast, which gave him an invincible nausea and disgust, although he had before received the greatest benefit from it. But, if the tar-water be taken and made in the manner prescribed at the beginning of this Essay, it will, if I mistake not, have enough of the salt to be useful, and little enough of the oil to be inoffensive. [[2]I mean my own manner of making it, and not the American[3], which makes it sometimes too strong and sometimes too weak; which tar-water, however it might serve as there used, merely for a preservative against the small-pox, yet may not be fit to use in all those various cases wherein I have found tar-water so successful.] Persons more delicate than ordinary may render it palatable, by mixing a drop of the chemical oil of nutmegs, or a spoonful of mountain-wine in each glass. It may not be amiss to observe that I have known some, whose nice stomachs could not bear it in the morning,

[1] Added in the second edition. [2] Added in the second edition.
[3] Cf. sect. 1.

take it at night going to bed without any inconvenience [[1] and that with some it agrees best warm, with others cold]. [[2] For outward washes and fomentations, it may be made stronger, as by pouring on warm water; also for brute beasts, as horses, in whose disorders I have found it very useful, I believe more so than that bituminous substance called Barbadoes tar.]

116. In very dangerous and acute cases much may be taken and often; as far as the stomach can bear. But in chronical cases, about half a pint night and morning may suffice [[3] or, in case so large a dose should prove disagreeable, half the quantity may be taken at four times, to wit, in the morning early, at night going to bed, and about two hours after dinner and breakfast]. A medicine of so great virtue in so many different disorders, and especially in that grand enemy the fever, must needs be a benefit to mankind in general. There are nevertheless three sorts of people to whom I would peculiarly recommend it: seafaring persons, ladies, and men of studious and sedentary lives.

117. To sailors and all seafaring persons, who are subject to scorbutic disorders and putrid fevers, especially in long southern voyages, I am persuaded this tar-water would be beneficial. And this may deserve particular notice in the present course of marine expeditions, when so many of our countrymen have perished by such distempers, contracted at sea and in foreign climates. Which, it is probable, might have been prevented by the copious use of tar-water.

118. This same water will also give charitable relief to the ladies (sect. 103), who often want it more than the parish poor; being many of them never able to make a good meal, and sitting pale, puny, and forbidden like ghosts, at their own table, victims of vapours and indigestion.

119. Studious persons also, pent up in narrow holes, breathing bad air, and stooping over their books, are much to be pitied. As they are debarred the free use of air and exercise, this I will venture to recommend as the

[1] Omitted in the later editions. [2] Added in the later editions.
[3] Added in the later editions.

best succedaneum to both. Though it were to be wished that modern scholars would, like the ancients, meditate and converse more in walks and gardens and open air, which upon the whole would perhaps be no hinderance to their learning, and a great advantage to their health. My own sedentary course of life had long since thrown me into an ill habit, attended with many ailments, particularly a nervous colic, which rendered my life a burthen, and the more so, because my pains were exasperated by exercise. But, since the use of tar-water, I find, though not a perfect recovery from my old and rooted illness, yet such a gradual return of health and ease, that I esteem my having taken this medicine the greatest of all temporal blessings, and am convinced that, under Providence, I owe my life to it.

120. In the distilling of turpentine and other balsams by a gentle heat, it hath been observed that there riseth first an acid spirit (sect. 7) that will mix with water; which spirit, except the fire be very gentle, is lost[1]. This grateful acid spirit that first comes over is, as a learned chemist and physician[2] informs us, highly refrigeratory, diuretic, sudorific, balsamic, or preservative from putrefaction, excellent in nephritic cases, and for quenching thirst—all which virtues are contained in the cold infusion which draws forth from tar only its fine flower or quintessence, if I may so say, or the native vegetable spirit, together with a little volatile oil.

121. The distinguishing principle of all vegetables—that whereon their peculiar smell, taste, and specific properties depend—seems to be some extremely fine and subtle spirit, whose immediate vehicle is an exceeding thin volatile oil; which is itself detained in a grosser and more viscid resin or balsam, lodged in proper cells in the bark and seeds, and most abounding in autumn or winter, after the crude

[1] Having, in the preceding sections, inferred the catholic efficacy of tar-water, Berkeley, in sect. 120–230, speculates on the physical causes of its wonderful medicinal properties. The speculation carries him into the science of Acids and Salts (sect. 120–156); and of Air, that common seminary of all life-giving elements (sect. 137–151); at last to Pure Æther, Light, or Vital Fire (sect. 152–230) —according to him, the *ultimate instrumental cause* in nature.

[2] Boerhaave.

juices have been thoroughly concocted, ripened, and impregnated with solar light. The spirit itself is by some supposed to be an oil highly subtilized, so as to mix with water. But such volatile oil is not the spirit, but only its vehicle. Since aromatic oils being long exposed to air will lose their specific smell and taste, which fly off with the spirit or vegetable salt, without any sensible diminution of the oil.

122. Those volatile salts that are set free and raised by a gentle heat may justly be supposed essential (sect. 8), and to have pre-existed in the vegetable; whereas the lixivial fixed salts, obtained by the incineration of the subject, whose natural constituent parts have been altered or destroyed by the extreme force of fire, are, by later chemists, upon very good grounds, supposed not to have pre-existed therein—all such salts appearing, from the experiments of Signor Redi [1], not to preserve the virtues of the respective vegetable subjects; and to be alike purgative and in an equal degree, whatsoever may be the shape of their points, whether sharp or obtuse. But, although fixed or lixivial salts may not contain the original properties of the subject, yet volatile salts, raised by a slight heat from vegetables, are allowed to preserve their native virtues: and such salts are readily imbibed by water.

123. The most volatile of the salts, and the most attenuated part of the oil may be supposed the first and readiest to impregnate a cold infusion (sect. 1, 7). And this will assist us to account for the virtues of tar-water. That volatile acid in vegetables, which resists putrefaction and is their great preservative, is detained in a subtle oil, miscible with water; which oil is itself imprisoned in the resin or grosser part of the tar, from which it is easily set free and obtained pure by cold water.

124. The mild native acids are observed more kindly to work upon, and more thoroughly to dissolve metallic bodies, than the strongest acid spirits produced by a vehement fire; and it may be suspected they have the same advantage as a medicine. And, as no acid, by the

[1] Francesco Redi (1626-1697), an Italian naturalist and poet, a member of the Della Crusca. See his *Experimenta Naturalia* (1675). His collected works occupy seven volumes.

observation of some of the best chemists, can be obtained from the substance of animals thoroughly assimilated, it should follow that the acids received into a healthy body must be quite subdued and changed by the vital powers: but it is easier to subdue and assimilate the gentler than the stronger acids (sect. 48).

125. I am very sensible that on such subjects arguments fall short of evidence: and that mine fall short even of what they might have been if I enjoyed better health, or those opportunities of a learned commerce from which I am cut off in this remote corner [1]. I shall nevertheless go on as I have begun, and proceed, by reason, by conjecture, and by authority, to cast the best light I can on the obscure paths that lie in my way.

126. Sir Isaac Newton [2], Boerhaave, and Homberg [3], are all agreed that the Acid is a fine subtle substance, pervading the whole terraqueous globe; which produceth divers kinds of bodies, as it is united to different subjects. [4] This, according to Homberg, is the pure salt, salt the principle, in itself similar and uniform, but never found alone. And although this principle be called the salt of the earth, yet it should seem it may more properly be called the salt of

[1] Berkeley's critics complained of neglect of 'negative instances,' or defective conceptionof inductive proof, in the experiments from which he inferred the *catholicity* of tar-water as a medicine.

[2] See Newton's tract of two pages, *De Natura Acidorum*, published apparently about 1692. It was followed by another equally brief, entitled *Cogitationes Variæ*, among which are suggestions on chemical subjects. Some of these reappear in the Queries at the end of his *Optics*. Those brief tracts contain nearly all that Newton published relating to chemistry.

[3] William Homberg (1652-1715), a French chemist, and first physician to the Duke of Orleans, born in Java. His writings consist of communications to the French Academy, whose *Mémoires* contain thirty-eight contributions (1699-1714) by Homberg. They relate almost exclusively to chemical questions, including the theory of acids and salts, and vegetable physiology. The *Histoire de l'Académie* (1715) contains an Eloge on Homberg. In Kopp's *Geschichte der Chemie* we have an account of him. Berkeley seems to have derived some of his chemical notions from Homberg, who was a good observer, but his inferences were often absurd. He held the old view of the *tria prima*—salt, sulphur, and mercury—of which, in different proportions, all material things were supposed to consist.

[4] Sect. 126-136 treat of the theory of acids, salts, alkalies, according to Newton, Boerhaave, and Homberg.

the air, since earth turned up and lying fallow receives it from the air. And it should seem that this is the great principle of vegetation, derived into the earth from all sorts of manures, as well as from the air. The acid is allowed to be the cause of fermentation in all fermented liquors. Why, therefore, may it not be supposed to ferment the earth, and to constitute that fine penetrating principle, which introduces and assimilates the food of plants, and is so fugitive as to escape all the filtrations and perquisitions of the most nice observers?

127. It is the doctrine of Sir Isaac Newton and Monsieur Homberg that, as the watery acid is that which renders salt soluble in water, so it is that same which joined to the earthy part makes it a salt. Let it therefore be considered that the organs of plants are tubes (sect. 30, 31, 35)—the filling, unfolding, and distending whereof, by liquors, doth constitute what is called the vegetation or growth of the plant. But earth itself is not soluble in water, so as to form one vegetable fluid therewith. Therefore the particles of earth must be joined with a watery acid; that is, they must become salts, in order to dissolve in water; that so, in the form of a vegetable juice, they may pass through the strainers and tubes of the root into the body of the plant, swelling and distending its parts and organs, that is, increasing its bulk. Therefore the vegetable matter of the earth is in effect earth changed into salt. And to render earth fertile is to cause many of its particles to assume a saline form.

128. Hence it is observed, there are more salts in the root than in the bark, more salts in vegetables during the spring than in the autumn or winter; the crude saline juices being in the summer months partly evaporated, and partly ripened, by the action and mixture of light. Hence also it appears why the dividing of earth, so as to enlarge its surface, whereby it may admit more acid from the air, is of such use in promoting vegetation: and why ashes, lime, and burnt clay are found so profitable manures, fire being in reality the acid, as is proved in the sequel (sect. 202). Marls also and shells are useful, forasmuch as those alkaline bodies attract the acid, and raise an effervescence with it, thereby promoting a fermentation in the glebe. The excrements of animals and putrid

vegetables do in like manner contribute to vegetation, by increasing the salts of the earth. And where fallows are well broken, and lie long to receive the acid of the air into all their parts; this alone will be sufficient to change many terrene particles into salts, and consequently render them soluble in water, and therefore a fit aliment for vegetables.

129. The acid, saith Homberg, is always joined to some sulphur, which determines it to this or that species, producing different salts, as it is the vegetable, bituminous, or metallic sulphur. Even the alkaline, whether volatile or lixivial salts, are supposed to be nothing but this same acid strictly detained by oil and earth, in spite of the extreme force of fire, which lodgeth in them, without being able to dislodge some remains of the acid.

130. Salts, according to Sir Isaac Newton, are dry earth and watery acid united by attraction, the acid rendering them soluble in water (sect. 127). He supposeth the watery acid to flow round the terrestrial part, as the ocean doth round the earth, being attracted thereby; and compares each particle of salt to a chaos, whereof the innermost part is hard and earthy, but the surface soft and watery. Whatever attracts and is attracted most strongly is an acid in his sense.

131. It seems impossible to determine the figures of particular salts. All acid solvents, together with the dissolved bodies, are apt to shoot into certain figures. And the figures in which the fossil salts crystallize have been supposed the proper natural shapes of them and their acids. But Homberg hath clearly shewed the contrary: forasmuch as the same acid dissolving different bodies assumes different shapes. Spirit of nitre, for instance, having dissolved copper, shoots into hexagonal crystals; the same having dissolved iron, shoots into irregular squares; and again, having dissolved silver, forms thin crystals of a triangular figure.

132. Homberg, nevertheless, holds in general, that acids are shaped like daggers, and alkalies like sheaths: and that, moving in the same liquor, the daggers run into the sheaths fitted to receive them with such violence as to raise that effervescence observed in the mixture of acids and alkalies. But it seems very difficult to conceive how or why the mere configuration of daggers and sheaths

floating in the same liquor should cause the former to rush with such vehemence, and direct their points so aptly into the latter, any more than a parcel of spigots and fossets floating together in the same water should rush one into the other.

133. It should seem rather that the vehement attraction which Sir Isaac Newton attributes to all acids, whereby he supposeth them to rush towards, penetrate, shake, and divide the most solid bodies, and to ferment the liquid of vegetables, could better account for this phenomenon. It is in this attraction that Sir Isaac placeth all their activity: and indeed it should seem, the figures of salts were not of such efficacy in producing their effects, as the strong active powers whereby they are agitated and do agitate other bodies. Especially if it be true (what was before remarked) that lixivious salts are alike purgative, whatever may be the shape of their angles, whether more or less acute or obtuse.

134. Sir Isaac Newton accounts for the watery acid's making earthy corpuscles soluble in water, by supposing the acid to be a mean between earth and water, its particles greater than those of water, and less than those of earth, and strongly to attract both. But perhaps there is no necessary reason for supposing the parts of the acid grosser than the parts of water, in order to produce this effect; may not this as well be accounted for, by giving them only a strong attraction or cohesion with the bodies to which they are joined?

135. The acid spirit or salt, that mighty instrument in the hand of nature, residing in the air, and diffused throughout that whole element, is discernible also in many parts of the earth, particularly in fossils, such as sulphur, vitriol, and alum. It was already observed, from Homberg, that this acid is never found pure, but hath always sulphur joined with it, and is classed by the difference of its sulphurs, whether mineral, vegetable, or animal.

136. Salts are vulgarly reckoned the most active of chemical principles. But Homberg derives all their activity from the sulphurs joined with them. From which also, as hath been said, he derives all their kinds and differences (sect. 129). Salt, water, oil, and earth seem to be originally the same in all vegetables. All the dif-

ference, according to the chemists, ariseth from a spirit residing in the oil, called the *rector* or *archæus*. This is otherwise called by chemists *ens primum*, or the native spirit; whereon depend, and wherein are contained, the peculiar flavour and odour, the specific qualities and virtues, of the plant[1].

137. These native spirits or vegetable souls are all breathed or exhaled into the Air[2], which seems the receptacle as well as source of all sublunary forms, the great mass or chaos which imparts and receives them. The air or atmosphere that surrounds our earth contains a mixture of all the active volatile parts of the whole habitable world, that is, of all vegetables, minerals, and animals. Whatever perspires, corrupts, or exhales, impregnates the air; which, being acted upon by the solar fire, produceth within itself all sorts of chemical operations, dispensing again those salts and spirits in new generations, which it had received from putrefactions.

138. The perpetual oscillations of this elastic and restless element operate without ceasing on all things that have life, whether animal or vegetable, keeping their fibres, vessels, and fluids in a motion, always changing; as heat, cold, moisture, dryness, and other causes alter the elasticity of the air: which accounts, it must be owned, for many effects. But there are many more which must be derived from other principles or qualities in the air. Thus iron and copper are corroded and gather rust in the air, and bodies of all sorts are dissolved or corrupted, which sheweth an acid to abound and diffuse itself throughout the air.

139. By this same air fire is kindled, the lamp of life preserved, respiration, digestion, nutrition, the pulse of the heart, and motion of all the muscles seem to be performed. Air therefore is a general agent, not only exerting its own, but calling forth the qualities or powers of all

[1] The chemists here spoken of as believing in an *archæus* were followers of Paracelsus. The *archæus* of Paracelsus seems to have been a supposed spiritual being.

[2] In sect. 135–152, he contemplates Air as the receptacle of the Acid or Vegetable Soul in which he supposes the virtue of tar-water to consist. The chemistry of the atmosphere was then unknown.

other bodies, by a division, comminution, and agitation of their particles, causing them to fly off and become volatile and active.

140. Nothing ferments, vegetates, or putrifies without air, which operates with all the virtues of the bodies included in it; that is, of all nature; there being no drug, salutary or poisonous, whose virtues are not breathed into the air. The air therefore is an active mass of numberless different principles, the general source of corruption and generation; on one hand dividing, abrading, and carrying off the particles of bodies, that is, corrupting or dissolving them; on the other, producing new ones into being; destroying and bestowing forms without intermission.

141. The seeds of things seem to lie latent in the air, ready to appear and produce their kind, whenever they light on a proper matrix. The extremely small seeds of fern, mosses, mushrooms, and some other plants are concealed and wafted about in the air, every part whereof seems replete with seeds of one kind or other. The whole atmosphere seems alive. There is everywhere acid to corrode, and seed to engender. Iron will rust, and mould will grow in all places. Virgin earth becomes fertile, crops of new plants ever and anon shew themselves; all which demonstrates the air to be a common seminary and receptacle of all vivifying principles.

142. Air may also be said to be the seminary of minerals and metals, as it is of vegetables. Mr. Boyle[1] informs us that the exhausted ores of tin and iron being exposed to the air become again impregnated with metal, and that ore of alum having lost its salt, recovers it after the same manner. And numberless instances there are of salts produced by the air; that vast collection or treasury of active principles, from which all sublunary bodies seem to derive their forms, and on which animals depend for their life and breath.

143. That there is some latent vivifying spirit dispersed

[1] In his *Observations about the growth of Metals in their ore, exposed to the Air.* See Boyle's *Works*, vol. III. pp. 459–462. Robert Boyle (1626–1692), an illustrious Irishman, often referred to by Berkeley, natural philosopher, chemist, and theologian, one of the founders of the Royal Society, and founder of the 'Boyle Lectures.' His *Life and Works*, edited by Dr. Birch, appeared in five vols. (1744).

throughout the air common experience sheweth; insomuch as it is necessary both to vegetables and animals (sect. 138, 139), whether terrestrial or aquatic, neither beasts, insects, birds, nor fishes being able to subsist without air. Nor doth all air suffice, there being some quality or ingredient of which when air is deprived it becometh unfit to maintain either life or flame. And this even though the air should retain its elasticity; which, by the bye, is an argument that air doth not act only as an antagonist to the intercostal muscles. It hath both that and many other uses. It gives and preserves a proper tone to the vessels: this elastic fluid promotes all secretions: its oscillations keep every part in motion: it pervades and actuates the whole animal system, producing great variety of effects, and even opposite in different parts, cooling at the same time and heating, distending and contracting, coagulating and resolving, giving and taking, sustaining life and impairing it, pressing without and expanding within, abrading some parts, at the same time insinuating and supplying others, producing various vibrations in the fibres and ferments in the fluids; all which must needs ensue from such a subtle, active, heterogeneous, and elastic fluid.

144. But there is, as we before observed, some one quality or ingredient in the air, on which life more immediately and principally depends. What that is, though men are not agreed, yet it is agreed it must be the same thing that supports the vital and the common flame; it being found that when air, by often breathing in it, is become unfit for the one, it will no longer serve for the other. The like is observable in poisonous damps or steams, wherein flame cannot be kindled, as is evident in the Grotto del Cane[1] near Naples. And here it occurs, to recommend the plunging them in cold water, as an experiment to be tried on persons affected by breathing a poisonous vapour in old vaults, mines, deep holes, or cavities under ground: which, I am apt to think, might save the lives of several, by what I have seen practised

[1] The *Grotto del Cane* is so charged with carbonic acid gas that light and life are speedily extinguished in it. It is described by Pliny, and seems to have been visited by Berkeley in his Italian tour.

on a dog convulsed, and in all appearance dead, but instantly reviving on being taken out of the above-mentioned Grotto, and thrown into a lake adjacent.

145. Air, the general menstruum and seminary, seemeth to be only an aggregate of the volatile parts of all natural beings, which, variously combined and agitated, produce many various effects. Small particles in a near and close situation strongly act upon each other, attracting, repelling, vibrating. Hence divers fermentations, and all the variety of meteors, tempests, and concussions both of earth and firmament. Nor is the microcosm less affected thereby. Being pent up in the viscera, vessels, and membranes of the body, by its salts, sulphurs, and elastic power, it engenders cholics, spasms, hysteric disorders, and other maladies.

146. The specific quality of air is taken to be permanent elasticity. Mr. Boyle is expressly of this opinion. And yet whether there be any such thing as permanently elastic air may be doubted, there being many things which seem to rob the air of this quality, or at least lessen and suspend its exertion. The salts and sulphurs, for instance, that float in the air abate much of its elasticity by their attraction.

147. Upon the whole, it is manifest that air is no distinct element, but a mass or mixture of things the most heterogeneous and even opposite to each other (sect. 137, 145), which become air by acquiring an elasticity and volatility from the attraction of some active subtle substance, whether it be called fire, æther, light, or the vital spirit of the world; in like manner as the particles of antimony, of themselves not volatile, are carried off in sublimation, and rendered volatile by cohering with the particles of sal ammoniac. But action and reaction being equal, the spring of this ethereal spirit is diminished by being imparted. Its velocity and subtlety are also less from its being mixed with grosser particles. Hence sound moves slower than light, as mud than water.

148. Whether air be only freed and fixed, or generated and destroyed, it is certain that air begins and ceases to exert or shew itself. Much by experiments seems to be generated, not only from animals, fruits, and vegetables, but also from hard bodies. And it is observed by Sir

Isaac Newton, that air produced from hard bodies is most elastic. The transmutation of elements, each into other, hath been anciently held. In Plutarch we find it was the opinion of Heraclitus, that the death of fire was a birth to air, and the death of air a birth to water[1]. This opinion is also maintained by Sir Isaac Newton. Though it may be questioned, whether what is thought a change be not only a disguise.

149. Fire seems the most elastic and expansive of all bodies. It communicates this quality to moist vapours and dry exhalations, when it heats and agitates their parts, cohering closely with them, overcoming their former mutual attraction, and causing them, instead thereof, reciprocally to repel each other, and fly asunder, with a force proportionable to that wherewith they had cohered.

150. Therefore in air we may conceive two parts; the one more gross, which was raised and carried off from the bodies of this terraqueous mass; the other a fine subtle spirit, by means whereof the former is rendered volatile and elastic. Together they compose a medium whose elasticity is less than that of pure æther, fire, or spirit, in proportion to the quantity of salts, vapours, and heterogeneous particles contained therein. Hence it follows that there is no such thing as the pure simple element of air. It follows also that on the highest mountains air should be more rare in proportion to the vulgar rule, of the spaces being reciprocally as the pressures: and so in fact it is said to have been found by the gentlemen of the French Academy of Sciences.

151. Æther, fire, or spirit, being attracted and clogged by heterogeneous particles, becometh less active; and the particles cohering with those of æther become more active

[1] See Ps.-Plutarch, *De Placit. Philos.* Lib. I. c. 3. Alchemy, or the ancient hypothesis that the apparent elements of matter may be transubstantiated into one ultimate element—implying that gold and silver may be produced from baser metals, and encouraging the search for a Panacea—was not neglected even in Berkeley's time. Newton had faith in alchemy, and devoted time to investigation of its processes. Leibniz, in his youth, was secretary to a society of Rosicrucians at Nuremberg, who practised alchemy. Alchemist speculation was not discouraged by Boyle and Locke. And the advanced science of our day has not abandoned the idea of scientific transubstantiation of matter.

than before. Air therefore is a mass of various particles, abraded and sublimated from wet and dry bodies of all sorts, cohering with particles of æther; the whole permeated by pure æther, or light, or fire: for these words are used promiscuously by ancient philosophers.

152. This Æther or pure invisible Fire[1], the most subtle and elastic of all bodies, seems to pervade and expand itself throughout the whole universe. If air be the immediate agent or instrument in natural things, it is the pure invisible fire that is the first natural mover or spring from whence the air derives its power (sect. 139, 149, 151). This mighty agent is everywhere at hand, ready to break forth into action, if not restrained and governed with the greatest wisdom. Being always restless and in motion, it actuates and enlivens the whole visible mass, is equally fitted to produce and to destroy, distinguishes the various stages of nature, and keeps up the perpetual round of generations and corruptions, pregnant with forms which it constantly sends forth and resorbs. So quick in its motions, so subtle and penetrating in its nature, so ex-

[1] We here (sect. 152–230) rise to a higher link in the Universal Chain, viz. Æther or invisible Fire. This, with Berkeley, connects all things in nature, and is thus their ultimate *physical* explanation. Fire has always been a mystery. It evades sense-perception; yet it seems to animate the phenomena of sense. Hence the supremacy attributed to it by the ancients. Whether fire is mechanically resolvable into motion, or motion is to be hyper-mechanically accounted for by animated fire, was a controverted alternative. Bacon, in the *Novum Organum*, concluded that heat and other sensible effects attributed to fire were due to motions in the particles of bodies —a doctrine favoured by Boyle and Newton. On the other hand, Berkeley's notion of animating, all-pervading fire, as the ultimate *physical* cause, to which all sensible changes are due, and under which the sensible universe is divinely concatenated, was countenanced among his contemporaries by Homberg and Boerhaave. Berkeley and this theory of fire are referred to in Richard Barton's *Analogy of Divine Wisdom* (Dublin, 2nd ed. 1750). 'Fire,' we are there told, 'is the universal fountain of life, order, distinction, stability, beauty of the universe. It is not only in the sun and other heavenly bodies, but it makes part of every lump of matter upon our globe. . . . So quick in its motion, so subtle and penetrating in its nature, so extensive in its effects; it seemeth no other than the Vegetative Soul and Vital Spirit of the World' (p. 63). See also [Casway's?] *Metaphysical Essay* (1748), pp. 32, &c.

tensive in its effects, it seemeth no other than the Vegetative Soul or Vital Spirit of the World.

153. [1] The animal spirit in man is the instrumental or physical cause both of sense and motion. To suppose sense in the world would be gross and unwarranted. But locomotive faculties [2] are evident in all its parts. The Pythagoreans, Platonists, and Stoics held the world to be an animal; though some of them have chosen to consider it as a vegetable [3]. However, the phænomena and effects do plainly shew there is a Spirit that moves, and a Mind or Providence that presides. This Providence, Plutarch [3] saith, was thought to be in regard to the world what the soul is in regard to man.

154. The order and course of things, and the experiments we daily make, shew there is a Mind that governs and actuates this mundane system, as the proper real agent and cause; and that the inferior instrumental cause is pure æther, fire, or the substance of light (sect. 29, 37, 136, 149), which is applied and determined by an Infinite Mind in the macrocosm or universe, with unlimited power, and according to stated rules, as it is in the microcosm with limited power and skill by the human mind. We have no proof, either from experiment or reason, of any other Agent, or efficient cause, than Mind or Spirit [4]. When, therefore, we speak of corporeal agents, or corporeal causes, this is to be understood in a different, subordinate, and improper sense [5].

[1] This and the three next sections, as well as sect. 160, 161, interpolate Berkeley's spiritual conception of Power, so prominent in the *De Motu*. They encourage the ancient doctrine of *anima mundi*, apparently to correct a tendency to suppose Fire *per se* the Universal Power.

[2] Cf. sect. 230.

[3] Cf. sect. 166, 172, 273–79, for the conception of the sensible universe as spiritually animated, not the mechanical result of inanimate force. The notion of eternal, all-pervading, vital Reason, not special creation, underlies ancient physical speculation. See Plato, *Timæus*, pp. 29, 30; Diog. Laert. Lib. VII.; Cicero, *De Nat. Deor.* Lib. II. c. 11; also Ps.-Plutarch, *De Placit. Philos.* Lib. V. c. 20.

[4] Cf. *Principles*, sect. 26–28.

[5] This implies that every change in nature presupposes a *sufficient* cause, and that this must be Active Reason; also that, in physical nature, *anything* might have been made by God the natural cause, i. e. natural sign, of *any* change.

155. The principles whereof a thing is compounded, the instrument used in its production, and the end for which it was intended, are all in vulgar use termed *causes*; though none of them be, strictly speaking, agent or efficient. There is not any proof that an extended corporeal or mechanical cause doth really and properly act; even motion itself being in truth a passion [1]. Therefore, though we speak of this fiery substance as *acting*, yet it is to be understood only as a mean or instrument; which indeed is the case of all mechanical causes whatsoever. They are, nevertheless, sometimes termed agents and causes, although they are by no means active in a strict and proper signification. When therefore force, power, virtue, or action is mentioned as subsisting in an extended and corporeal or mechanical being, this is not to be taken in a true, genuine, and real, but only in a gross and popular sense; which sticks in appearances, and doth not analyze things to their first principles. In compliance with established language and the use of the world, we must employ the popular current phrase. But then in regard to truth we ought to distinguish its meaning. It may suffice to have made this declaration once for all, in order to avoid mistakes.

156. The *calidum innatum*, the vital flame, or animal spirit in man, is supposed the *cause* of all motions in the several parts of his body, whether voluntary or natural. That is, it is accounted the instrument, by means whereof the *mind* exerts and manifests herself in the motions of the body. In the same sense, may not *fire* be said to have force, to operate and agitate the whole system of the world; which is held together, and informed by one presiding Mind; and animated throughout by one and the same fiery substance, as an instrumental and mechanical agent, not as a primary real efficient?

157. This pure spirit or invisible fire is ever ready to exert and shew itself in its effects (sect. 152), cherishing, heating, fermenting, dissolving, shining, and operating, in various manners, where a subject offers to employ or

[1] Cf. sect. 160; also *De Motu*, which teaches that all sensible things are passive, and that living and intending Spirit is the only sufficient cause.

determine its force. It is present in all parts of the earth and firmament, though perhaps latent and unobserved, till some accident produceth it into act, and renders it visible in its effects.

158. There is no effect in nature, great, marvellous, or terrible, but proceeds from Fire, that diffused and active principle, which, at the same time that it shakes the earth and heavens[1], will enter, divide, and dissolve the smallest, closest, and most compacted bodies. In remote cavities of the earth it remains quiet, till perhaps an accidental spark, from the collision of one stone against another, kindles an exhalation that gives birth to an earthquake or tempest which splits mountains or overturns cities. This same fire stands unseen in the focus of a burning glass, till subjects for it to act upon come in its way, when it is found to melt, calcine, or vitrify the hardest bodies.

159. No eye could ever hitherto discern, and no sense perceive, the animal spirit in a human body, otherwise than from its effects. The same may be said of pure fire, or the spirit of the universe, which is perceived only by means of some other bodies, on which it operates, or with which it is joined. What the chemists say of pure acids being never found alone might as well be said of pure fire.

160. The mind of man acts by an instrument *necessarily*[2]. The τὸ ἡγεμονικόν, or Mind presiding in the world, acts by an instrument *freely*. Without instrumental and second causes, there could be no regular course of nature. And without a regular course, nature could never be understood; mankind must always be at a loss, not knowing what to expect, or how to govern themselves, or direct their actions for the obtaining of any end. Therefore in the government of the world physical agents, improperly so called, or mechanical, or second causes, or natural causes, or

[1] Cf. Hebrews xii. 26–29.

[2] This is in the spirit of the opening aphorisms of the *Novum Organum*, which teach that in order to bring about changes in nature *man* must conform to the established laws which determine the changes. A divinely maintained sense-symbolism is with Berkeley the basis of human science of nature. Nature is thus fundamentally supernatural. Physical inquiry may disregard its supernatural side: philosophy (unless it is 'minute') recognises both sides.

instruments, are necessary to assist, not the governor, but the governed[1].

161. In the human body the mind orders and moves the limbs: but the animal spirit is supposed the immediate physical cause of their motion. So likewise in the mundane system, a mind presides: but the immediate, mechanical, or instrumental cause, that moves or animates all its parts, is the pure elementary fire or spirit of the world. The more fine and subtle part or spirit is supposed to receive the impressions of the First Mover, and communicate them to the grosser sensible parts of this world. Motion, though in metaphysical rigour and truth a passion or mere effect, yet in physics passeth for an action[2]. And by this action all effects are supposed to be produced. Hence the various communications, determinations, accelerations of motion, constitute the laws of nature.

162. The pure æther or invisible fire contains parts of different kinds, that are impressed with different forces, or subjected to different laws of motion, attraction, repulsion, and expansion, and endued with divers distinct habitudes towards other bodies. These seem to constitute the many various qualities (sect. 37, 40, 44), virtues, flavours, odours, and colours which distinguish natural productions. The different modes of cohesion, attraction, repulsion, and motion appear to be the source from whence specific properties are derived, rather than different shapes or figures. This, as hath been already observed[3], seems confirmed by the experiment of fixed salts operating one way, notwithstanding the difference of their angles. The original particles, productive of odours, flavours, and other

[1] Cf. with this important parenthetical section, Berkeley's *Principles*, sect. 60-66, in which he explains and vindicates the function of natural causes and the office of physical science, under his new conception of matter. He thus explains how, if God is the only agent in natural law, there is still room for the elaborate sense-symbolism or material world, which man is busy in interpreting and using.

[2] Cf. sect. 155, and the *De Motu*, passim. With Berkeley *motion* is a sensible manifestation of the animated and invisible Fire. His ultimate conception is that of a living and teleological, not a blindly moved, universe—movement being the expression of all-pervading life and meaning. It is taken for granted that Life is inexplicable by mechanical or chemical laws, and is presupposed in all real existence.

[3] Cf. sect. 131-133.

properties, as well as of colours, are, one may suspect, all contained and blended together in that universal and original seminary of pure and elementary fire; from which they are diversely separated and attracted, by the various subjects of the animal, vegetable, and mineral kingdoms; which thereby become classed into kinds, and endued with those distinct properties which continue till their several forms, or specific proportions of fire, return into the common mass.

163. As the soul acts immediately on pure fire, so pure fire operates immediately on air; that is, the abrasions of all terrestrial things being rendered volatile and elastic by fire (sect. 149, 150, 152), and at the same time lessening the volatility and expansive force of the fire, whose particles they attract and adhere to (sect. 147), there is produced a new fluid, more volatile than water or earth, and more fixed than fire. Therefore, the virtues and operations imputed to air must be ultimately attributed to fire, as that which imparts activity to air itself.

164. The element of æthereal fire or light seems to comprehend, in a mixed state, the seeds, the natural causes and forms (sect. 43), of all sublunary things. The grosser bodies separate, attract, and repel the several constituent particles of that heterogeneous element; which, being parted from the common mass, make distinct essences, producing and combining together such qualities and properties as are peculiar to the several subjects, and thence often extracted in essential oils or odoriferous waters, from whence they exhale into the open air, and return into their original element.

165. Blue, red, yellow, and other colours, have been discovered by Sir Isaac Newton to depend on the parted rays or particles of light. And, in like manner, a particular odour or flavour seemeth to depend on peculiar particles of light or fire (sect. 40); as appears from heats being necessary to all vegetation whatsoever, and from the extreme minuteness and volatility of those vegetable souls or forms, flying off from the subjects without any sensible diminution of their weight. These particles, blended in one common ocean, should seem to conceal the distinct forms, but, parted and attracted by proper subjects, disclose or produce them. As the particles of

light, which, when separated, form distinct colours, being blended are lost in one uniform appearance.

166. Agreeably thereto[1] an æthereal substance or Fire was supposed by Heraclitus[2] to be the seed of the generation of all things, or that from which all things drew their original. The Stoics also taught that all substance was originally fire, and should return to fire: that an active subtle fire was diffused or expanded throughout the whole universe; the several parts whereof were produced, sustained, and held together, by its force[3]. And it was the opinion of the Pythagoreans, as Laertius informs us, that heat or fire was the principle of life, animating the whole system, and penetrating all the elements (sect. 152, 153). The Platonists, too, as well as the Pythagoreans, held fire to be the immediate natural agent, or animal spirit; to cherish, to warm, to heat, to enlighten, to vegetate, to produce the digestions, circulations, secretions, and organical motions, in all living bodies, vegetable or animal, being effects of that element, which, as it actuates the macrocosm, so it animates the microcosm. In the *Timæus*[4] of Plato, there is supposed something like a net of fire and rays of fire in a human body. Doth not this seem to mean the animal spirit, flowing, or rather darting, through the nerves?

167. According to the Peripatetics, the form of heaven, or the fiery æthereal substance, contains the form of all inferior beings (sect. 43). It may be said to teem with forms, and impart them to subjects fitted to receive them.

[1] In sect. 166–187 we have a collection of authorities—Greek (sect. 166–176) and Oriental (sect. 177–187)—in support of the hypothesis that *æther* or *fire* is the ultimate, informing and unifying, *natural* cause of change in bodies.

[2] Schleiermacher, Bernays, Lassalle, Zeller, and others have cast fresh light on Heraclitus; the most grandly suggestive figure of the Pre-Socratic age, from whom the 'philosophy of fire' descends. The Germans have disinterred 'the dark philosopher,' long *nominis umbra*, in recent histories and monographs. See especially the *Philosophie Herakleitos des Dunkeln* (1858) of Lassalle. In Ferrier's *Lectures on Greek Philosophy* (1866) there is an interesting account of Heraclitus.

[3] Berkeley seems to found on Diogenes Laertius and the Pseudo-Plutarch. See Zeller's *Philosophie der Griechen*, for the elemental fire, or world-soul, of the Stoics.

[4] Pp. 45, 78.

The vital force thereof in the Peripatetic sense is vital to all, but diversely received according to the diversity of the subjects. So all colours are virtually contained in the light; but their actual distinctions of blue, red, yellow, and the rest, depend on the difference of the objects which it illustrates. Aristotle, in the book *De Mundo*[1], supposeth a certain fifth essence, an æthereal nature, unchangeable and impassive; and next in order a subtle flaming substance, lighted up or set on fire by that æthereal and Divine nature. He supposeth, indeed, that God is in heaven, but that His power, or a force derived from Him, doth actuate and pervade the universe.

168. If we may credit Plutarch[2], Empedocles thought æther or heat to be Jupiter. Æther by the ancient philosophers was used to signify promiscuously sometimes fire and sometimes air. For they distinguish two sorts of air. Plato, in the *Timæus*[3], speaking of air, saith there are two kinds; the one more fine and subtle, called æther; the other more gross, and replete with vapours. This æther or purer medium seems to have been the air or principle from which all things, according to Anaximenes, derived their birth, and into which they were back again resolved at their death. Hippocrates, in his treatise *De Diæta*[4], speaketh of a fire pure and invisible; and this fire, according to him, is that which, stirring and giving movement to all things, causes them to appear, or, as he styles it, come into evidence, that is, to exist, every one in its time, and according to its destiny.

169. This pure fire, æther, or substance of light was accounted in itself invisible and imperceptible to all our senses, being perceived only by its effects, such as heat, flame, and rarefaction.—To which we may add, that the Moderns pretend farther to have perceived it by weight, inasmuch as the aromatic oils which most abound with fire, as being the most readily and vehemently inflamed,

[1] See cap. 2. The *De Mundo* is not now accepted as Aristotle's.

[2] Ps.-Plutarch, *De Placit. Philos.* Lib. I. c. 3.

[3] P. 58.

[4] *Opera*, tom. I. p. 639 (ed. Leips. 1825). An unsuspected relation between Hippocrates (B. C. 460–357) and Heraclitus (cir. B. C. 500–460) was discovered by the research of Professor Bernays of Bonn, in his *Heraclitea*, where he traces, with acuteness, a series of quotations from Heraclitus embedded in the text of the *De Diæta*.

are above all others the heaviest. And by an experiment of Mr. Homberg's, four ounces of regulus of antimony, being calcined by a burning-glass for an hour together, were found to have imbibed and fixed seven drachms of the substance of light.

170. Such is the rarefying and expansive force of this element, as to produce, in an instant of time, the greatest and most stupendous effects: a sufficient proof not only of the power of fire, but also of the wisdom with which it is managed, and withheld from bursting forth every moment to the utter ravage and destruction of all things. And it is very remarkable that this same element, so fierce and destructive, should yet be so variously tempered and applied as to be withal the salutary warmth, the genial, cherishing, and vital flame of all living creatures. It is not therefore to be wondered that Aristotle[1] thought the heat of a living body to be somewhat Divine and celestial, derived from that pure æther to which he supposed the incorporeal Deity (χωριστὸν εἶδος) to be immediately united, or on which he supposed it immediately to act.

171. The Platonists held that intellect resided in soul, and soul in an æthereal vehicle. And that as the soul was a middle nature, reconciling intellect with æther, so æther was another middle nature, which reconciled and connected the soul with grosser bodies (sect. 152, 154). Galen[2] likewise taught that, admitting the soul to be incorporeal, it hath for its immediate tegument or vehicle

[1] See *De Anim. Generat.* Lib. III. c. 11; also *De Anima*, Lib. II. c. 4. Aristotle is apt to refer the connexion of soul and body to universally diffused animal heat; a notion which the Stoics carried further, in identifying God, or the world-soul, with the vital Fire. On the physics and cosmology of the Stoics, see Plutarch, *De Stoic. Rep.* 41; Stob. *Ecl. Phys.* I, and Diog. Laert. Lib. VII; also Zeller. Like Heraclitus, they regarded fire as the universal cosmological force, which regulates the mundane system, and under which, after regular evolution in the ages, it is to dissolve in a universal conflagration.

[2] See *Opera*, tom. IV. p. 470 (ed. Bas.) for a passage which partly corresponds to this. Galen (A.D. 130–201) would be the most learned physician, and one of the most voluminous writers of antiquity, if all the works attributed to him could be received as genuine. In the treatise on Hippocrates and Plato, and in other Galenic works, may be found passages on Fire not unlike that referred to, but I have not found any exactly corresponding to it. Galen was an admirer of Hippocrates; for whose doctrine on this subject, cf. sect. 168, 174, 175.

a body of æther or fire, by the intervention whereof it moveth other bodies, and is mutually affected by them. This interior clothing was supposed to remain upon the soul, not only after death, but after the most perfect purgation, which, in length of time, according to the followers of Plato and Pythagoras, cleansed the soul,

'purumque reliquit
Æthereum sensum, atque auraï simplicis ignem[1].'

This tunicle of the soul, whether it be called pure æther, or luciform vehicle, or animal spirit, seemeth to be that which moves and acts upon the gross organs, as it is determined by the soul from which it immediately receives impression, and in which the moving force truly and properly resides. Some moderns have thought fit to deride all that is said of æthereal vehicles, as mere jargon or words without a meaning. But they should have considered that all speech concerning the soul is altogether, or for the most part, metaphorical; and that, agreeably thereunto, Plato[2] speaketh of the mind or soul, as a driver that guides and governs a chariot, which is, not unfitly, styled αὐγήειδες, a luciform æthereal vehicle or ὄχημα—terms expressive of the purity, lightness, subtlety, and mobility of that fine celestial nature in which the soul immediately resides and operates.

172. It was a tenet of the Stoics that the world was an animal, and that Providence answered to the reasonable soul in man. But then the Providence or Mind was supposed by them to be immediately resident or present in fire, to dwell therein, and to act thereby. Briefly, they conceived God to be an intellectual and fiery spirit, πνεῦμα νοερὸν καὶ πυρῶδες. Therefore, though they looked on fire (sect. 166) as the τὸ ἡγεμονικόν or governing principle of the world; yet it was not simply fire, but animated with a mind.

173. Such are the bright and lively signatures of a Divine Mind, operating and displaying itself in fire and light throughout the world, that, as Aristotle observes, in his book *De Mundo*[3], all things seem full of divinities, whose apparitions on all sides strike and dazzle our eyes.

[1] Virgil, *Æneid* VI. 746.
[2] *Phædrus*, p. 246. Cf. *Alciphron*, Dial. VII. 16.
[3] Cap. 6. Cf. p. 305, note 1. But the *De Mundo* is not by Aristotle.

And it must be owned the chief philosophers and wise men of antiquity, how much soever they attributed to second causes and the force of fire, yet they supposed a Mind or Intellect always resident therein, active or provident, restraining its force, and directing its operations.

174. Thus Hippocrates, in his treatise *De Diæta*[1], speaks of a strong but invisible fire (sect. 168), that rules all things without noise. Herein, saith he, reside soul, understanding, prudence, growth, motion, diminution, change, sleep, and waking. This is what governs all things, and is never in repose. And the same author, in his tract *De Carnibus*[2], after a serious preface, setting forth that he is about to declare his own opinion, expresseth it in these terms:—'That which we call heat, θερμόν, appears to me something immortal, which understands all things, which sees and knows both what is present and what is to come.'

175. This same heat is also what Hippocrates calls nature, the author of life and death, good and evil. It is farther to be noted of this heat, that he maketh it the object of no sense. It is that occult universal nature, and inward invisible force, which actuates and animates the whole world, and was worshipped by the ancients under the name of Saturn; which Vossius judges not improbably to be derived from the Hebrew word *satar*, to lie hidden or concealed. And what hath been delivered by Hippocrates agrees with the notions of other philosophers: Heraclitus (sect. 157), for instance, who held fire to be the principle and cause of the generation of all things, did not mean thereby an inanimate element, but, as he termed it, πῦρ ἀείζωον, an everlasting fire[3].

176. Theophrastus, in his book *De Igne*, distinguisheth between heat and fire. The first he considers as a principle or cause; not that which appeareth to sense as a passion or accident existing in a subject, and which is in truth the effect of that unseen principle. And it is remarkable that he refers the treating of this invisible fire

[1] *Opera*, tom. I. p. 639.

[2] The original is as follows:—Δοκέει δέ μοι τὸ καλεόμενον θερμόν, ἀθάνατόν τε εἶναι, καὶ νοεῖν πάντα, καὶ ὁρῆν καὶ ἀκούειν καὶ εἰδέναι πάντα, καὶ τὰ ὄντα καὶ τὰ μέλλοντα ἔσεσθαι. *Opera*, tom. I. p. 425.

[3] See Ritter and Preller, No. 34; Heracl. ap. Clem. Alex. *Strom.* V. p. 599. Matter was in a manner spiritualised in the Fire of Heraclitus, called ψυχή by Aristotle (*De Anima*, Lib. I. c. 2).

or heat to the investigation of the First Causes. Fire, the principle, is neither generated nor destroyed, is everywhere and always present (sect. 157); while its effects in different times and places shew themselves more or less, and are very various, soft and cherishing, or violent and destructive, terrible or agreeable, conveying good and evil, growth and decay, life and death, throughout the mundane system[1].

177. It is allowed by all that the Greeks derived much of their philosophy from the Eastern nations[2]. And Heraclitus is thought by some to have drawn his principles from Orpheus, as Orpheus did from the Egyptians; or, as others write, he had been auditor of Hippasus, a Pythagorean, who held the same notion of fire, and might have derived it from Egypt by his master Pythagoras, who had travelled into Egypt, and been instructed by the sages of that nation. One of whose tenets it was, that fire was the principle of all action; which is agreeable to the doctrine of the Stoics, that the whole of things is administered by a fiery intellectual spirit. In the *Asclepian Dialogue*[3], we find this notion, that all parts of the world vegetate by a fine subtle aether, which acts as an engine or instrument, subject to the will of the supreme God.

178. As the Platonists held intellect to be lodged in soul, and soul in æther (sect. 171); so it passeth for a doctrine of Trismegistus in the Pimander[4], that mind is clothed by soul, and soul by spirit. Therefore, as the animal spirit of man, being subtle and luminous, is the immediate tegument of the human soul, or that wherein and whereby she acts; even so the spirit of the world, that active fiery ethereal substance of Light, that permeates and animates the whole system, is supposed to clothe the soul, which clothes the mind of the universe.

179. The Magi likewise said of God, that He had light for His body and truth for His soul. And in the Chaldaic

[1] Theophrastus dwells on the distinction between *θερμός* and *πῦρ* in various parts of this treatise.

[2] In sect. 177–187 Berkeley turns to the East.

[3] One of the famous Hermic Books, but not by Hermes; Egyptian in doctrine, while written in Greek, and entitled, Ὁ τέλειος λόγος.

[4] *Pœmander*, the most celebrated of the Hermic writings—not by Hermes.

oracles, all things are supposed to be governed by a πῦρ νοερόν, or intellectual fire. And in the same oracles, the creative mind is said to be clothed with fire, ἐσσάμενος πυρὶ πῦρ, which oriental reduplication of the word fire seems to imply the extreme purity and force thereof. Thus also in the Psalms, 'Thou art clothed with light as with a garment.' Where the word rendered light might have been rendered fire; the Hebrew letters being the same with those in the word which signifies fire, all the difference being in the pointing, which is justly counted a late invention. That other Scripture sentence is remarkable: 'Who maketh his ministers a flaming fire[2]:' which might, perhaps, be rendered more agreeably to the context, as well as consistently with the Hebrew, after this manner: 'Who maketh flaming fire his ministers:' and the whole might run thus: 'Who maketh the winds his messengers, and flaming fire his ministers.'

180. A notion of something Divine in fire, animating the whole world, and ordering its several parts, was a tenet of very general extent (sect. 156, 157, 163, 166, 167, 168, 170, 172, 173, 174, 175, 177, &c.), being embraced in the most distant times and places, even among the Chinese themselves; who make *tien*, æther, or heaven, the sovereign principle or cause of all things, and teach that the celestial virtue, by them called *li*, when joined to a corporeal substance, doth fashion, distinguish, and specificate all natural beings. This *li* of the Chinese seems to answer the forms of the Peripatetics, and both bear analogy to the foregoing philosophy of fire[1].

181. The heaven is supposed pregnant with virtues and forms, which constitute and discriminate the various species of things. And we have more than once observed that, as the light, fire, or celestial æther, being parted by refracting or reflecting bodies, produceth variety of colours; even so, that same apparently uniform substance, being parted and secreted by the attracting and repelling powers of the divers secretory ducts of plants and animals, that is, by natural chemistry, produceth or imparteth the various specific properties of natural bodies. Whence the tastes, and odours, and medicinal virtues so various in vegetables.

[1] So, too, the Celtic festival of *Beltien*, originally connected with fire-worship.

182. The *tien* is considered and adored by the learned Chinese as living and intelligent æther, the πῦρ νοερόν of the Chaldeans and the Stoics. And the worship of things celestial, the sun and stars, among the Eastern nations less remote, was on account of their fiery nature, their heat and light, and the influence thereof. Upon these accounts, the sun was looked on by the Greek theologers as the spirit of the world, and the power of the world[1]. The cleansing quality, the light and heat of fire, are natural symbols of purity, knowledge, and power, or, if I may so say, the things themselves, so far as they are perceptible to our senses, or in the same sense as motion is said to be action. Accordingly, we find a religious regard was paid to fire, both by Greeks and Romans, and indeed by most, if not all, the nations of the world.

183. The worship of Vesta at Rome was, in truth, the worship of fire.

'Nec tu aliud Vestam quam vivam intellige flammam,'

saith Ovid in his Fasti[2]. And as in old Rome the eternal fire was religiously kept by virgins, so in Greece, particularly at Delphi and Athens, it was kept by widows. It is well known that Vulcan or fire was worshipped with great distinction by the Egyptians. The Zabii or Sabeans are also known to have been worshippers of fire. It appears too, from the Chaldean oracles, that fire was regarded as Divine by the sages of that nation. And it is supposed that Ur of the Chaldeans was so called from the Hebrew word signifying fire, because fire was publicly worshipped in that city. That a religious worship was paid to fire by the ancient Persians and their Magi is attested by all antiquity. And the sect of Persees, or old Gentiles, of whom there are considerable remains at this day both in the Mogul's country and in Persia, doth testify the same.

184. It doth not seem that their prostrations before the perpetual fires, preserved with great care in their Pyreia, or fire temples, were merely a civil respect, as Dr. Hyde would have it thought. Although he brings good proof that they do not invoke the fire on their altars, or pray

[1] See Professor Max Müller, on the original elements of mythology, in the *Oxford Essays* (1856), and in his Gifford Lectures. The development of Sun-worship is a curious subject in comparative religion.

[2] Lib. VI. 291.

to it, or call it God: and that they acknowledge a supreme invisible Deity. Civil respects are paid to things as related to civil power: but such relation doth not appear in the present case. It should seem, therefore, that they worship God as present in the fire, which they worship or reverence not ultimately or for itself, but relatively to the supreme Being. Which it is not unlikely was elsewhere the case at first, though the practice of men, especially of the vulgar, might in length of time degenerate from the original institution, and rest in the object of sense.

185. Doctor Hyde, in his *History of the Religion of the Ancient Persians*, would have it thought that they borrowed the use and reverence of perpetual fires, from the Jewish practice prescribed in the Levitical law of keeping a perpetual fire burning on the altar[1]. Whether that was the case or not, thus much one may venture to say: it seems probable that, whatever was the original of this custom among the Persians, the like customs among the Greeks and Romans were derived from the same source.

186. It must be owned there are many passages in Holy Scripture (sect. 179) that would make one think the Supreme Being was in a peculiar manner present and manifest in the element of Fire. Not to insist that God is more than once said to be a consuming fire, which might be understood in a metaphorical sense, the Divine apparitions were by fire, in the bush, at Mount Sinai, on the tabernacle, in the cloven tongues. God is represented in the inspired writings, as descending in fire, as attended by fire, or with fire going before Him. Celestial things, as angels, chariots, and such-like phænomena, are invested with fire, light, and splendour. Ezekiel in his visions beheld fire and brightness, lamps, burning coals of fire, and flashes of lightning. In a vision of Daniel, the throne of God appeared like a fiery flame, and His wheels like burning fire. Also a fiery flame issued and came forth from before Him.

187. At the transfiguration, the apostles saw our Saviour's face shining as the sun, and His raiment white as light, also a lucid cloud, or body of light, out of which the voice

[1] See his *Veterum Persarum et Medorum Religionis Historia*, c. 6, 8. Dr. Hyde (1636–1703) was Professor of Hebrew in Oxford, and Canon of Christ Church.

came; which visible light and splendour were, not many centuries ago, maintained by the Greek church to have been Divine, and uncreated, and the very glory of God; as may be seen in the History wrote by the Emperor John Cantacuzene[1]. And of late years Bishop Patrick gives it as his opinion, that in the beginning of the world the Shechinah, or Divine presence, which was then frequent and ordinary, appeared by light or fire. In commenting on that passage, where Cain is said to have gone out from the presence of the Lord, the Bishop observes, that if Cain after this turned a downright idolater, as many think, it is very likely he introduced the worship of the sun, as the best resemblance he could find of the glory of the Lord, which was wont to appear in a flaming light. It would be endless to enumerate all the passages of Holy Scripture, which confirm and illustrate this notion, or represent the Deity as appearing and operating by fire; the misconstruction of which might possibly have misled the Gnostics, Basilidians, and other ancient heretics into an opinion that Jesus Christ was the visible corporeal sun.

188. We have seen that in the most remote ages and countries, the vulgar as well as the learned, the institutions of lawgivers as well as the reasonings of philosophers have ever considered the element of fire in a peculiar light, and treated it with more than common regard, as if it were something of a very singular and extraordinary nature. Nor are there wanting authors of principal account among the Moderns who entertain like notions concerning fire, especially among those who are most conversant in that element, and should seem best acquainted with it[2].

189. Mr. Homberg, the famous modern chemist, who brought that art to so great perfection, holds the substance of light or fire to be the true chemic principle sulphur (sect. 129), and to extend itself throughout the whole universe. It is his opinion that this is the only

[1] Cantacuzeni *Historiarum* Lib. II. c. 39, 40. John V, Byzantine emperor (Joannes Cantacuzenus), born about 1292. In 1354 he abdicated, and betook himself to a monastic life, when he wrote a History of the Eastern Empire during the former part of the fourteenth century. He ranks as one of the Byzantine historians.

[2] Sect. 188-205 refer chiefly to modern authorities in support of the 'Fire philosophy.'

active principle; that mixed with various things it formeth several sorts of natural productions: with salts making oil, with earth bitumen, with mercury metal; that this principle of sulphur, fire, or the substance of light, is in itself imperceptible, and only becomes sensible as it is joined with some other principle, which serves as a vehicle for it; that, although it be the most active of all things, yet it is at the same time the most firm bond and cement to combine and hold the principles together, and give form to the mixed bodies; and that in the analysis of bodies it is always lost, escaping the skill of the artist, and passing through the closest vessels [1].

190. Boerhaave[2], Nieuwentyt[3], and divers other moderns[4] are in the same way of thinking. They with the ancients distinguish a pure elementary invisible fire from the culinary, or that which appears in ignited bodies (sect. 163, 166). This last they will not allow to be pure fire. The pure fire is to be discerned by its affects alone; such as heat, dilatation of all solid bodies, and rarefaction of fluids, the segregating heterogeneous bodies, and congregating those that are homogeneous. That therefore which smokes and flames is not pure fire, but that which is collected in the focus of a [5 concave] mirror or burning-glass. This fire seems the source of all the operations

[1] See Homberg's *Essais du Soufre-Principe*, in the Memoirs of the Academy (1705), where he maintains that sulphur, when assumed to be the primary ingredient in all bodies, is fire; and thus that fire is coeval and coextensive with body. When chemists of the school to which Berkeley here refers speak of Fire as the elementary substance, they generally mean (as far as meaning can be found in their words) elementary sulphur.

[2] In his *Elementa Chemiæ* Boerhaave represents fire as the *natural* cause of motion—its true activity being referred to spiritual or intending agency.

[3] Bernard Nieuwentyt (1654–1718), a Dutch physician, mathematician, and natural theologian. His criticism of the differential calculus called forth John Bernoulli and Leibniz in defence.

In natural theology he curiously anticipates Paley's well-known illustration of the watch. See the English translation of Nieuwentyt's *Religious Philosopher* (1730), Preface, pp. 46–49.

[4] Thus, S. Gravesande argues that fire is the catholic element in Nature, obtainable from all bodies by friction, which puts their latent fire in motion (*Element. Phys.* I. 2. c. 1); and Lemery, the younger, asserts the ingenerable nature of fire, arguing that it is equally diffused through space, and the universal element in bodies (*Mém. de l'Acad.*, 1713).

[5] Not in the early editions.

in nature: without it nothing either vegetates or putrefies, lives or moves or ferments, is dissolved or compounded or altered, throughout this whole natural world in which we subsist. Were it not for this, the whole would be one great stupid inanimate mass. But this active element is supposed to be everywhere, and always present, imparting different degrees of life, heat, and motion to the various animals, vegetables, and other natural productions, as well as to the elements themselves wherein they are produced and nourished.

191. As water acts upon salt, or aquafortis upon iron, so fire dissolves all other bodies. Fire, air, and water are all three menstruums: but the two last seem to derive all their force and activity from the first (sect. 149). And indeed there seems to be, originally or ultimately, but one menstruum in nature, to which all other menstruums may be reduced. Acid salts are a menstruum, but their force and distinct powers are from sulphur. Considered as pure, or in themselves, they are all of the same nature. But, as obtained by distillation, they are constantly joined with some sulphur, which characterizeth and cannot be separated from them. This is the doctrine of Monsieur Homberg. But what is it that characterizeth or differenceth the sulphurs themselves? If sulphur be the substance of light, as that author will have it, whence is it that animal, vegetable, and metallic sulphurs impart different qualities to the same acid salt? Can this be explained upon Homberg's principles? And are we not obliged to suppose that light, separated by the attracting and repelling powers in the strainers, ducts, and pores of those bodies, doth form several distinct kinds of sulphur, all which, before such separation, were lost and blended together, in one common mass of light or fire, seemingly homogeneous?

192. In the analysis of inflammable bodies, the fire or sulphur is lost, and the diminution of weight sheweth the loss (sect. 169). Oil is resolved into water, earth, and salt, none of which is inflammable. But the fire or *vinculum* which connected those things, and gave the form of oil, escapes from the artist. It disappears but is not destroyed. Light or fire imprisoned made part of the compound, gave union to the other parts, and form

to the whole. But, having escaped, it mingles with the general ocean of æther, till, having again parted and attracted, it enters and specificates some new subject of the animal, vegetable, or mineral kingdom. Fire, therefore, in the sense of philosophers, is always fire, though not always flame.

193. Solar fire or light, in calcining certain bodies, is observed to add to their weight[1]. There is therefore no doubt but light can be fixed, and enter the composition of a body. And though it should lie latent for a long time, yet, being set free from its prison, it shall still shew itself to be fire. Lead, tin, or regulus of antimony, being exposed to the fire of a burning-glass, though they lose much in smoke and steam, are nevertheless found to be considerably increased in weight, which proves the introduction of light or fire into their pores. It is also observed that urine produceth no phosphorus unless it be long exposed to the solar light. From all which it may be concluded, that bodies attract and fix the light; whence it should seem, as some have observed, that fire without burning is an ingredient in many things, as water without wetting.

194. Of this there cannot be a better proof than the experiment of Monsieur Homberg, who made gold of mercury by introducing light into its pores, but at such trouble and expense, that I suppose nobody will try the experiment for profit. By this junction of light and mercury, both bodies became fixed, and produced a third different from either, to wit, real gold. For the truth of which fact, I refer to the Memoirs of the French Academy of Sciences[2]. From the foregoing experiment it appears that gold is only a mass of mercury penetrated and cemented by the substance of light, the particles of those bodies attracting and fixing each other. This seems to have been not altogether unknown to former philosophers; Marcilius Ficinus[3], the Platonist, in his com-

[1] Cf. sect. 169. This was Boyle's explanation, long ago exploded, like many of the other chemical explanations accepted in these sections.

[2] See Homberg's *Mémoire* (1700) —'Sur les Dissolvans du Mercure.' In Barton's *Analogy* this passage in *Siris* is referred to.

[3] Marcilius Ficinus (1433–99), the famous Florentine physician and philosopher, who led the revival of Platonism and Neoplatonism. He translated or commented

mentary on the first book of the second Ennead of Plotinus, and others likewise before him, regarding mercury as the mother, and sulphur as the father of metals; and Plato himself, in his Timæus describing gold to be a dense fluid with a shining yellow light, which well suits a composition of light and mercury[1].

195. Fire or light mixeth with all bodies (sect. 157), even with water; witness the flashing lights in the sea, whose waves seem frequently all on fire. Its operations are various according to its kind, quantity, and degree of vehemence. One degree keeps water fluid, and another turns it into elastic air (sect. 149). And air itself seems to be nothing else but vapours and exhalations, rendered elastic by fire. Nothing flames but oil; and sulphur with water, salt, and earth compose oil, which sulphur is fire: therefore fire enclosed attracts fire, and causeth the bodies whose composition it enters to burn and blaze.

196. Fire collected in the focus of a glass operates in vacuo, and therefore is thought not to need air to support it. Calx of lead hath gone off with an explosion in vacuo, which Nieuwentyt and others take for a proof that fire can burn without air. But Mr. Hales[2] attributes this effect to air enclosed in the red lead, and perhaps too in the receiver, which cannot be perfectly exhausted.

on Plato, Plotinus, Jamblicus, and Proclus. Ficinus, with his affinity for Neoplatonism, and for Hermic and Oriental lore, his endeavours to harmonise Plato and Aristotle, and his aspirations to reunion with God through a contemplative life, seems to have attracted Berkeley strongly in his later days. Berkeley appears to have studied Plotinus and the other Neoplatonists largely through Ficinus, who may have led him to recognise the community of some of their doctrines with his own early philosophy. It was perhaps from the eclecticism of Ficinus that he was induced to mix up the opinions of earlier and later philosophers with those of Plato.

[1] This curious section, with its authorities in support of alchemy —the speculation attributed originally to Hermes Trismegistus, and which seemed to culminate in Paracelsus and Marcilius Ficinus, Lully and Van Helmont—has some affinity with facts and speculations in recent chemistry in its tendency to ultimate unity of elements. Cf. sect. 69, 71, on mercury as a supposed Catholicon; and sect. 148, on the transmutation of the supposed elements. For Plato on gold, see *Timæus*, p. 59.

[2] *Statical Essays*, vol. I. pp. 278–80. This is Dr. Stephen Hales (1677–1761), rector of Teddington, who afterwards wrote on Tar-water, and to whom Berkeley addressed a *Letter* on its virtues in the Plague.

When common lead is put into the fire in order to make red lead, a greater weight of this comes out than was put in of common lead. Therefore the red lead should seem impregnated with fire. Mr. Hales thinks it is with air. The vast expansion of compound aqua fortis, Mr. Nieuwentyt will have to proceed from fire alone. Mr. Hales contends that air must necessarily co-operate. Though, by Nieuwentyt's experiment, it should seem the phosphorus burns equally with and without air.

197. Perhaps they who hold the opposite sides in this question may be reconciled by observing that air is in reality nothing more than particles of wet and dry bodies volatilized and rendered elastic by fire (sect. 147, 150, 151). Whatever, therefore, is done by air must be ascribed to fire; which fire is a subtle invisible thing, whose operation is not to be discerned but by means of some grosser body, which serves not for a pabulum to nourish the fire, but for a vehicle to arrest and bring it into view. Which seems the sole use of oil, air, or any other thing that vulgarly passeth for a pabulum or food of that element.

198. To explain this matter more clearly, it is to be observed that fire, in order to become sensible, must have some object to act upon. This, being penetrated and agitated by fire, affects us with light, heat, or some other sensible alteration. And this subject so wrought upon may be called culinary fire. In the focus of a burning-glass exposed to the sun, there is real actual fire; though not discerned by the sense till it hath somewhat to work on, and can shew itself in its effects, heating, flaming, melting, and the like. Every ignited body is, in the foregoing sense, culinary fire. But it will not therefore follow that it is convertible into pure elementary fire. This, for aught that appears, may be ingenerable and incorruptible by the course of nature[1]. It may be fixed and imprisoned in a compound (sect. 169, 192, 193), and yet retain its nature, though lost to sense, and though it return into the invisible elementary mass, upon the analysis of the compounded body: as is manifest in the solution of stone lime by water.

199. It should seem, therefore, that what is said of air's

[1] As held by the younger Lemery, to whom Berkeley afterwards refers (sect. 244).

being the pabulum of fire, or being converted into fire, ought to be understood only in this sense; to wit, that air, being less gross than other bodies, is of a middle nature, and therefore more fit to receive the impressions of a fine æthereal fire (sect. 163), and impart them to other things. According to the ancients, soul serveth for a vehicle to intellect (sect. 178), and light or fire for a vehicle to the soul; and, in like manner, air may be supposed a vehicle to fire, fixing it in some degree, and communicating its effects to other bodies.

200. The pure invisible fire or æther doth permeate all bodies, even the hardest and most solid, as the diamond. This alone, therefore, cannot, as some learned men have supposed, be the cause of muscular motion, by a mere impulse of the nerves communicated from the brain to the membranes of the muscles, and thereby to the enclosed æther, whose expansive motion, being by that means increased, is thought to swell the muscles and cause a contraction of the fleshy fibres. This, it should seem, the pure æther cannot do immediately and of itself, because, supposing its expansive motion to be increased, it must still pass through the membranes, and consequently not swell them, inasmuch as æther is supposed freely to pervade the most solid bodies. It should seem, therefore, that this effect must be owing, not to pure æther, but to æther in some part fixed and arrested by the particles of air.

201. Although this æther be extremely elastic, yet, as it is sometimes found by experience to be attracted, imprisoned, and retained in gross bodies (sect. 169), so we may suppose it to be attracted, and its expansive force diminished, though it should not be quite fixed, by the loose particles of air, which combining and cohering therewith may bring it down, and qualify it for intercourse with grosser things. Pure fire may be said to animate air, and air other things. Pure fire is invisible; therefore flame is not pure fire. Air is necessary both to life and flame. And it is found by experiment that air loseth in the lungs the power of feeding flame. Hence it is concluded that the same thing in air contributes both to life and flame. Vital flame survives culinary flame in vacuo: therefore it requires less of that thing to sustain it.

202. What this may be, whether some certain proportion, or some peculiar parts, of æther, is not easy to say. But thus much seems plain, that whatever is ascribed to acid may be also ascribed to fire or æther. The particles of æther fly asunder with the greatest force: therefore, agreeably to Sir Isaac Newton's doctrine, when united they must attract each other with the greatest force. Therefore they constitute the acid. For, whatsoever strongly attracts and is attracted, may be called an acid, as Sir Isaac Newton informs us in his tract *De Acido*. Hence it should seem that the sulphur of Homberg, and the acid of Sir Isaac are at bottom one and the same thing, to wit, pure fire or æther.

203. The vital flame or æthereal spirit, being attracted and imprisoned in grosser bodies, seemeth to be set free and carried off by the superior attraction of a subtle and pure flame. Hence, perhaps, it is, that lightning kills animals, and turns spirituous liquors vapid in an instant.

204. Hippocrates, in his book concerning the Heart[1], observeth that the soul of man is not nourished by meats and drinks from the lower belly, but by a pure and luminous substance darting its rays, and distributing a non-natural nourishment, as he terms it, in like manner as that from the intestines is distributed to all parts of the body. This luminous non-natural nourishment, though it be secreted from the blood, is expressly said not to come from the lower belly. It is plain, therefore, he thought it came into the blood, either by respiration, or by attraction through the pores. And it must be acknowledged that somewhat igneous or æthereal, brought by the air into the blood, seems to nourish, though not the soul itself, yet the interior tunicle of the soul, the *auraï simplicis ignem*.

205. That there is really such a thing as vital flame, actually kindled, nourished, and extinguished, like common flame, and by the same means, is an opinion of some moderns, particularly of Dr. Willis[2] in his tract *De San-*

[1] *Opera*, tom. I. p. 490.

[2] Thomas Willis (1621–1675), called by Anthony Wood 'the most celebrated physician of his time,' author of the *De Anima Brutorum*. There are several editions of his collected works. The tract here referred to is entitled *De Sanguinis Incalescentia, sive Accensione*.

guinis Accensione: that it requires constant eventilation, through the trachæa and pores of the body for the discharge of a fuliginous and excrementitious vapour; and that this vital flame, being extremely subtle, might not be seen any more than shining flies or *ignes fatui* by daylight. And yet it hath sometimes become visible on divers persons, of which there are undoubted instances. This is Dr. Willis's notion: and perhaps there may be some truth in this, if it be so understood as that light or fire might indeed constitute the animal spirit or immediate vehicle of the soul.

206. There have not been wanting those, who, not content to suppose Light the most pure and refined of all corporeal beings, have gone farther, and bestowed upon it some attributes of a yet higher nature[1]. Julianus, the Platonic philosopher, as cited by Ficinus, saith it was a doctrine in the theology of the Phœnicians, that there is diffused throughout the universe a pellucid and shining nature, pure and impassive, the act of a pure intelligence. And Ficinus himself undertakes to prove that light is incorporeal by several arguments: because it enlightens and fills a great space in an instant, and without opposition: because several lights meet without resisting each other: because light cannot be defiled by filth of any kind: because the solar light is not fixed in any subject: lastly, because it contracts and expands itself so easily without collision, condensation, rarefaction, or delay, throughout the vastest space. These reasons are given by Ficinus, in his comment on the first book[2] of the second Ennead of Plotinus.

207. But it is now well known that light moves, and that its motion is not instantaneous: that it is capable of condensation, rarefaction, and collision: that it can be mixed with other bodies, enter their composition, and increase their weight (sect. 169, 192, 193). All which seems sufficiently to overthrow those arguments of Ficinus, and shew light to be corporeal. There appears indeed some difficulty at first sight, about the non-resistance of

[1] Light or fire is considered in [illegible] its alleged [illegible] yet other aspects of [illegible] and [illegible] in particular in regard to [illegible]

[2] Cap. 3.

rays or particles of light occurring one to another, in all possible directions or from all points. Particularly, if we suppose the hollow surface of a large sphere studded with eyes looking inwards one at another, it may perhaps seem hard to conceive how distinct rays from every eye should arrive at every other eye without justling, repelling, and confounding each other.

208. But these difficulties may be got over by considering, in the first place, that visible points are not mathematical points[1], and consequently that we are not to suppose every point of space a radiating point. Secondly, by granting that many rays do resist and intercept each other, notwithstanding which the act of vision may be performed. Since as every point of the object is not seen, so it is not necessary that rays from every such point arrive at the eye. We often see an object, though more dimly, when many rays are intercepted by a gross medium.

209. Besides, we may suppose the particles of light to be indefinitely small, that is, as small as we please, and their aggregate to bear as small a proportion to the void as we please, there being nothing in this that contradicts the phænomena. And there needs nothing more, in order to conceive the possibility of rays passing from and to all visible points, although they be not incorporeal. Suppose a hundred ports placed round a circular sea, and ships sailing from each port to every other; the larger the sea, and the smaller the vessels are supposed, the less danger will there be of their striking against each other. But, as there is by hypothesis no limited proportion between the sea and the ships, the void and solid particles of light, so there is no difficulty that can oblige us to conclude the sun's light incorporeal from its free passage; especially when there are so many clear proofs of the contrary. As for the difficulty, therefore, attending the supposition of a sphere studded with eyes looking at each other, this is removed only by supposing the particles of light exceeding small relatively to the empty spaces.

210. Plotinus[2] supposeth that from the sun's light, which is corporeal, there springs forth another equivocal light

[1] Cf. *New Theory of Vision*, sect. 150-152.

[2] See *Second Ennead*, Lib. I. c. 7, in the Commentary of Ficinus; also *Timæus*, pp. 45, 55-56.

which is incorporeal, and as it were the brightness of the former. Marcilius Ficinus[1] also, observing it to be a doctrine in the *Timæus* of Plato, that there is an occult fire or spirit diffused throughout the universe, intimates that this same occult invisible fire or light is, as it were, the sight of the mundane soul. And Plotinus in his fourth Ennead[1] sheweth it to be his opinion that the world seeth itself and all its parts. The Platonic philosophers do wonderfully refine upon light, and soar very high: from coal to flame; from flame to light; from this visible light to the occult light of the celestial or mundane soul, which they supposed to pervade and agitate the substance of the universe by its vigorous and expansive motion.

211. If we may believe Diogenes Laertius[2], the Pythagorean philosophers thought there was a certain pure heat or fire, which had somewhat Divine in it, by the participation whereof men became allied to the gods. And according to the Platonist, heaven is not defined so much by its local situation as by its purity. The purest and most excellent fire, that is heaven, saith Ficinus[3]. And again, the hidden fire that everywhere exerts itself, he calls celestial. He represents fire as most powerful and active, dividing all things, abhorring all composition or mixture with other bodies. And, as soon as it gets free, relapsing instantly into the common mass of celestial fire, which is everywhere present and latent.

212. This[4] is the general source of life, spirit, and strength, and therefore of health to all animals, who constantly receive its illapses clothed in air, through the lungs and pores of the body. The same spirit, imprisoned in food and medicines, is conveyed into the stomach, the bowels, the lacteals, circulated and secreted by the several ducts, and distributed throughout the system (sect. 37, 42, 44). Plato, in his *Timæus*[5], enumerating the ignited juices, names wine in the first place, and tar in the second. But wine is pressed from the grape, and fermented by human industry. Therefore of all ignited juices purely natural, tar or resin must in his account be esteemed the first.

[1] Lib. V. c. 8.
[2] Diog. Laert. Lib. VIII. p. 585.
[3] Ficinus on *Second Ennead*, Lib. I.
[4] Sect. 212-219 sum up the doctrine of *Siris* regarding the relations of the invisible Fire to animal and vegetable Life.
[5] P. 60.

213. The vivifying luminous æther exists in all places, even the darkest caverns; as is evident from hence, that many animals see in those dark places, and that fire may be kindled in them by the collision or attrition of bodies. It is also known that certain persons have fits of seeing in the dark. Tiberius was said[1] to have had this faculty or distemper. I myself knew an ingenious man who had experienced it several times in himself. And Dr. Willis, in his tract *De Sanguinis Accensione*, mentions another of his own knowledge. This luminous æther or spirit is therefore said by Virgil[2] to nourish or cherish the innermost earth, as well as the heavens and celestial bodies.

> 'Principio cœlum ac terras, camposque liquentes,
> Lucentemque globum Lunæ, Titaniaque astra
> Spiritus intus alit.'

214. The principles of motion and vegetation in living bodies seem to be delibations from the invisible fire or spirit of the universe (sect. 43, 157, 164, 171): which though present to all things, is not nevertheless one way received by all; but variously imbibed, attracted, and secreted, by the fine capillaries, and exquisite strainers in the bodies of plants and animals, whereby it becomes mixed and detained in their juices.

215. It hath been thought by some observers of nature that the fine glandular vessels admit from the common mass of the blood only such juices as are homogeneous to those with which they were originally imbued. How they came to be so imbued doth not appear. But thus much is plain; that fine tubes attract fluids, that the glands are fine tubes, and that they attract very different juices from the common mass. The same holds also with regard to the capillary vessels of vegetables (sect. 30, 31, 33, 35), it being evident that, through the fine strainers in the leaves and all over the body of the plant, there be juices or fluids of a particular kind drawn in, and separated from the common mass of air and light. And that the most elaborate spirit, whereon the character or distinguishing virtue and properties of the plant depend, is of a luminous (sect. 37, 43) and volatile nature, being lost or escaping into air

[1] *Suetonius*, cap. 68. [2] *Æneid*, VI. 724-26.

or æther, from essential oils and odoriferous waters, without any sensible diminution of them.

216. As different kinds of secreted light or fire produce different essences, virtues, or specific properties, so also different degrees of heat produce different effects. Thus, one degree of heat keeps the blood from coagulating, and another degree coagulates the blood. Thus, a more violent fire hath been observed to set free and carry off that very light, which a more moderate fire had introduced and fixed in the calcined regulus of antimony. In like manner, one kind or quantity of this æthereal fiery spirit may be congenial and friendly to the spirits of a man, while another may be noxious.

217. And experience sheweth this to be true[1]. For, the fermented spirit of wine or other liquors produceth irregular motions, and subsequent depressions in the animal spirits. Whereas the luminous spirit lodged and detained in the native balsam of pines and firs is of a nature so mild, and benign, and proportioned to the human constitution, as to warm without heating, to cheer but not inebriate[2], and to produce a calm and steady joy like the effect of good news, without that sinking of spirits which is a subsequent effect of all fermented cordials. I may add, without all other inconvenience, except that it may like any other medicine be taken in too great a quantity for [[3]a nice] stomach. In which case it may be right to lessen the dose, or to take it only once in the four and twenty hours, empty, going to bed (when it is found to be least offensive), or even to suspend the taking of it for a time, till nature shall seem to crave it, and rejoice in its benign and comfortable spirit.

218. Tar-water, serving as a vehicle to this spirit, is both diuretic and diaphoretic, but seems to work its

[1] The train of thought here (sect. 217-219) returns to the medical and other properties of tar-water.

[2] So Cowper—

> . . . . 'The cups,
> That cheer but not inebriate, wait on each;
> So let us welcome peaceful evening in.'

The Task, Bk. IV. 39. The coincidence can hardly be accidental. Cowper, born in 1731, was grown up when *Siris* was the rage—for its therapeutic novelties and proposed Panacea.

[3] 'too nice a'—in first edition.

principal effect by assisting the *vis vitæ*, as an alterative and cordial, enabling nature, by an accession of congenial spirit, to assimilate that which could not be assimilated by her proper force, and so to subdue the *fomes morbi*. And this should seem in most cases the best and safest course. Great evacuations weaken nature as well as the disease. And it is to be feared that they who use salivations and copious bleedings, may, though they should recover of the distemper, in their whole life be never able to recover of the remedies.

219. It is true, indeed, that in chronical cases there is need of time to complete a cure; and yet I have known this tar-water in disorders of the lungs and stomach to prove a very speedy remedy, and to allay the anxiety and heat of a fever in an instant, giving ease and spirits to the patient. This I have often experienced, not without surprise at seeing these salutary effects follow so immediately in a fever on taking a glass of tar-water. Such is the force of these active vivifying principles contained in this balsam.

220. Force or power, strictly speaking, is in the Agent alone who imparts an equivocal force to the invisible elementary fire, or animal spirit of the world (sect. 153, 156, 157); and this to the ignited body or visible flame, which produceth the sense of light and heat[1]. In this chain the first and last links[2] are allowed to be incorporeal: the two intermediate[3] are corporeal, being capable of motion, rarefaction, gravity, and other qualities of bodies. It is fit to distinguish these things, in order to avoid ambiguity concerning the nature of fire.

221. Sir Isaac Newton, in his *Optics*[4], asks, Is not fire a body heated so hot as to emit light copiously? for what else, adds he, is a red-hot iron than fire? Now, it should

[1] In sect. 220–230, Berkeley, criticising Newtonian theories of Light and elastic Æther, recalls the pervading thought of his own philosophy—its ultimate reference of all proper efficiency in the universe to living and ever realising Mind. He distinguishes the spiritual from the corporeal or symbolical links in the Universal Chain; also Fire from the invisible effects; and the Newtonian from his own fiery Æther.

[2] i. e. the Supreme Agent, and the sentient intelligence.

[3] i. e. the invisible Fire, and the visible flame.

[4] Bk. III. Qu. 9.

seem that to define fire by heat would be to explain a thing by itself. A body heated so hot as to emit light is an ignited body; that is, hath fire in it, is penetrated and agitated by fire, but is not itself fire. And although it should in the third foregoing acceptation, or vulgar sense[1], pass for fire, yet it is not the pure elementary fire (sect. 190) in the second or philosophic sense—such as was understood by the sages of antiquity, and such as is collected in the focus of a burning-glass; much less is it the *vis*, force, or power of burning, destroying, calcining, melting, vitrifying, and raising the perceptions of light and heat: this is truly and really in the incorporeal Agent, and not in the vital spirit of the universe. Motion, and even power in an equivocal sense, may be found in this pure æthereal spirit, which ignites bodies, but is not itself the ignited body; being an instrument or medium by which the real agent (sect. 160) doth operate on grosser bodies.

222. It hath been shewed in Sir Isaac Newton's *Optics*[2], that light is not reflected by impinging on bodies, but by some other cause. And to him it seems probable that as many rays as impinge on the solid parts of bodies are not reflected, but stifled and retained in the bodies. And it is certain the great porosity of all known bodies affords room for much of this light or fire to be lodged therein. Gold itself, the most solid of all metals, seems to have far more pores than solid parts, from water being pressed through it in the Florentine experiment, from magnetic effluvia passing, and from mercury entering, its pores so freely. And it is admitted that water, though impossible to be compressed, hath at least forty times more pores than solid parts. And, as acid particles, joined with those of earth in certain proportions, are so closely united with them as to be quite hid and lost to all appearance, as in *mercurius dulcis* and common sulphur, so also may we conceive the particles of light or fire to be absorbed and latent in grosser bodies.

223. It is the opinion of Sir Isaac Newton that somewhat unknown remains *in vacuo*, when the air is exhausted. This unknown medium he calls æther[3]. He supposeth

[1] i. e. as visible flame.

[2] Bk. II. Prop. 8.

[3] In his *Letter to Mr. Boyle on the Cause of Gravitation* (Feb. 28,

it to be more subtle in its nature, and more swift in its motion, than light, freely to pervade all bodies, and by its immense elasticity to be expanded throughout all the heavens. Its density is supposed greater in free and open spaces than within the pores of compact bodies. And in passing from the celestial bodies to great distances, it is supposed to grow denser and denser continually; and thereby cause those great bodies to gravitate towards one another, and their respective parts towards their centres, every body endeavouring to pass from the denser parts of the medium towards the rarer.

224. The extreme minuteness of the parts of this medium, and the velocity of their motion, together with its gravity, density, and elastic force, are thought to qualify it for being the cause of all the natural motions in the universe. To this cause are ascribed the gravity and cohesion of bodies. The refraction of light is also thought to proceed from the different density and elastic force of this æthereal medium in different places. The vibrations of this medium, alternately concurring with, or obstructing the motions of the rays of light, are supposed to produce the fits of easy reflection and transmission. Light by the vibrations of this medium is thought to communicate heat to bodies. Animal motion and sensation are also accounted for by the vibrating motions of this æthereal medium, propagated through the solid capillaments of the nerves. In a word, all the phænomena and properties of bodies, that were before attributed to attraction, upon later thoughts seem ascribed to this æther, together with the various attractions themselves.

225. But, in the philosophy of Sir Isaac Newton, the fits (as they are called) of easy transmission and reflexion seem as well accounted for by vibrations excited in bodies by the rays of light, and the refraction of light by the attraction of bodies. To explain the vibrations of light by

1679), Newton thus propounds his hypothesis of an *elastic* Æther: —'And first I suppose there is diffused through all places an æthereal substance, capable of contraction or dilation, strongly elastic; in a word, much like air in all respects, but far more subtle. I suppose this Æther pervades all gross bodies, but yet so as to stand rarer in their pores than in free places; and so much the rarer as their pores are less. And this I suppose to be the cause,' &c. (*Opera*, vol. IV. pp. 384–394). Cf. *Optics*, Bk. III. Qu. 18–23.

those of a more subtle medium seems an uncouth explication. And gravity seems not an effect of the density and elasticity of æther, but rather to be produced by some other cause: which Sir Isaac himself insinuates [1] to have been the opinion even of those ancients who took vacuum, atoms, and the gravity of atoms, for the principles of their philosophy; tacitly attributing (as he well observes) gravity to some other cause distinct from matter, from atoms, and consequently from that homogeneous æther or elastic fluid. The elasticity of which fluid is supposed to depend upon, to be defined and measured by, its density; and this by the quantity of matter in one particle, multiplied by the number of particles contained in a given space; and the quantity of matter in any one particle [[2] or body of a given size] to be determined by its gravity. Should not therefore gravity seem the original property and first supposed? On the other hand, if force be considered as prescinded from gravity and matter, and as existing only in points or centres [3], what can this amount to but an abstract, spiritual, incorporeal force?

226. It doth not seem necessary, from the phænomena, to suppose any medium more active and subtle than light or fire. Light being allowed to move at the rate of about ten millions of miles in a minute, what occasion is there to conceive another medium of still smaller and more moveable parts? Light or fire seems the same with æther. So the ancients understood, and so the Greek word implies. It pervades all things (sect. 157), is everywhere present. And this same subtle medium, according to its various quantities, motions, and determinations, sheweth itself in different effects or appearances, and is æther, light, or fire.

227. The particles of æther fly asunder with the greatest force; therefore when united they must (according to the Newtonian doctrine) attract each other with the greatest force; therefore they are acids, or constitute the acid (sect. 130); but this united with earthy parts maketh alkali, as Sir Isaac teacheth in his tract *De Acido* [4]: alkali, as

[1] *Optics*, Bk. III. Qu. 28. See also Clarke's *Fifth Reply* to Leibniz.

[2] In the early editions.

[3] As in Boscovich's theory, and in some recent speculations, e. g. *The World Dynamical and Immaterial* (1868), by R. S. Wyld.

[4] Newton, *De Natura Acidorum*. See sect. 126, note 2.

appears in cantharides and lixivial salts, is a caustic; caustics are fire; therefore acid is fire; therefore æther is fire; and if fire, light. We are not therefore obliged to admit a new medium distinct from light, and of a finer and more exquisite substance, for the explication of phænomena which appear to be as well explained without it. How can the density or elasticity of æther account for the rapid flight of a ray of light from the sun, still swifter as it goes farther from the sun? Or how can it account for the various motions and attractions of different bodies? Why oil and water, mercury and iron, repel, or why other bodies attract each other? Or why a particle of light should repel on one side and attract on the other, as in the case of the Islandic crystal? To explain cohesion by hamate atoms is accounted *ignotum per ignotius*. And is it not as much so to account for the gravity of bodies by the elasticity of æther?

228. It is one thing to arrive at general laws of nature from a contemplation of the phænomena; and another to frame an hypothesis, and from thence deduce the phænomena. Those who suppose epicycles, and by them explain the motions and appearances of the planets, may not therefore be thought to have discovered principles true in fact and nature. And, albeit we may from the premises infer a conclusion, it will not follow that we can argue reciprocally, and from the conclusion infer the premises. For instance, supposing an elastic fluid, whose constituent minute particles are equidistant from each other, and of equal densities and diameters, and recede one from another with a centrifugal force which is inversely as the distance of the centres; and admitting that from such supposition it must follow that the density and elastic force of such fluid are in the inverse proportion of the space it occupies when compressed by any force; yet we cannot reciprocally infer that a fluid endued with this property must therefore consist of such supposed equal particles: for it would then follow that the constituent particles of air were of equal densities and diameters; whereas it is certain that air is an heterogeneous mass, containing in its composition an infinite variety of exhalations, from the different bodies which make up this terraqueous globe.

229. The phænomena of light, animal spirit, muscular motion, fermentation, vegetation, and other natural operations, seem to require nothing more than the intellectual and artificial fire of Heraclitus, Hippocrates, the Stoics (sect. 166, 168), and other ancients. Intellect, superadded to æthereal spirit, fire, or light, moves, and moves regularly; proceeding in a method, as the Stoics, or increasing and diminishing by measure, as Heraclitus expressed it. The Stoics held that fire comprehended and included the spermatic reasons or forms (λόγους σπερματικούς) of all natural things. As the forms of things have their ideal existence in the intellect, so it should seem that seminal principles have their natural existence in the light (sect. 164); a medium consisting of heterogeneous parts, differing from each other in divers qualities that appear to sense, and not improbably having many original properties, attractions, repulsions, and motions, the laws and natures whereof are indiscernible to us, otherwise than in their remote effects. And this animated heterogeneous fire should seem a more adequate cause, whereby to explain the phænomena of nature, than one uniform æthereal medium.

230. Aristotle, indeed, excepts against the elements being animated. Yet nothing hinders why that power of the soul styled by him κινητική, or locomotive[1], may not reside therein, under the direction of an Intellect, in such sense and as properly as it is said to reside in animal bodies. It must nevertheless be owned, that albeit that philosopher acknowledgeth a Divine force or energy in fire, yet to say that fire is alive, or that having a soul it should not be alive, seem to him equally absurd. See his second book *De Partibus Animalium*[2].

231. [3]The laws of attraction and repulsion are to be

[1] Cf. sect. 153.

[2] Cap. 3. See also the *De Anima*, Lib. I. c. 5, where Aristotle seems to reject the supposition (adopted partly to explain perception) that the principle of Life (ψυχή) is diffused through the universe; or at least to deny that if an animated Fire or Air were so diffused, it could be identified with the Life to which animal motion is referred.

[3] Sect. 231–54 reject the 'corpuscularian,' or mechanical, conception of attraction, as well as the Newtonian hypothesis of an elastic Æther (insufficient even as a physical explanation), as no ultimate

regarded as laws of motion; and these only as rules or methods observed in the productions of natural effects, the efficient and final causes whereof are not of mechanical consideration. Certainly, if the explaining a phænomenon be to assign its proper efficient and final cause (sect. 154, 155, 160), it should seem the mechanical philosophers never explained any thing; their province being only to discover the laws of nature, that is, the general rules and methods of motion; and to account for particular phænomena by reducing them under, or shewing their conformity to, such general rules.

232. Some corpuscularian philosophers of the last age have indeed attempted to explain the formation of this world and its phænomena by a few simple laws of mechanism. But, if we consider the various productions of nature, in the mineral, vegetable, and animal parts of the creation, I believe we shall see cause to affirm, that not any one of them has hitherto been, or can be, accounted for, on principles merely mechanical; and that nothing could be more vain and imaginary than to suppose with Descartes, that merely from [1a circular motion's] being impressed by the Supreme Agent on the particles of extended substance, the whole world, with all its several parts, appurtenances, and phænomena, might be produced, by a necessary consequence, from the laws of motion.

233. Others suppose that God did more at the beginning; having then made the seeds of all vegetables and animals, containing their solid organical parts in miniature, the gradual filling and evolution[2] of which, by the influx

account of Nature; inasmuch as *being perceived*, and *being moved by spiritual agency*, are two necessary implicates of concrete reality. Berkeley, like Plato, recognises Mind as Agent in all motion; but he does not attribute motion to mind. Like Plato, too, in the *Timæus*, he distinguishes vital Fire, and universally animating Soul, from Supreme Eternal Mind. The interpolated medium, like the Plastic Nature of Cudworth, may be due to a tendency (of which in his early writings Berkeley shews no sign), first to assume, and then to try to bridge over, a chasm between Divine Reason or Will and the data of the senses.

[1] 'Circular motions'—in the first edition. He alludes to the vortices of Descartes; which that philosopher held conjoined with faith in constant Divine causation—not a pre-established harmony.

[2] 'evolution,' i. e. divinely regulated evolution, the conception of which is in harmony with the philosophy involved in *Siris*.

of proper juices, doth constitute the generation and growth of a living body. So that the artificial structure of plants and animals daily generated requires no present exercise of art to produce it, having been already framed at the origin of the world, which with all its parts hath ever since subsisted; going like a clock or machine by itself, according to the laws of nature, without the immediate hand of the artist[1]. But how can this hypothesis explain the blended features of different species in mules and other mongrels? or the parts added or changed, and sometimes whole limbs lost, by marking in the womb? or how can it account for the resurrection of a tree from its stump, or the vegetative power in its cuttings? in which cases we must necessarily conceive something more than the mere evolution of a seed.

234. Mechanical laws of nature or motion direct us how to act, and teach us what to expect. Where intellect presides there will be method and order, and therefore rules, which if not stated and constant would cease to be rules. There is therefore a constancy in things, which is styled the Course of Nature[2] (sect. 160). All the phænomena in nature are produced by motion[3]. There appears an uniform working in things great and small, by attracting and repelling forces. But the particular laws of attraction and repulsion are various. Nor are we concerned at all about the forces, neither can we know or measure them otherwise than by their effects, that is to say, the motions; which motions only, and not the forces, are indeed in the bodies (sect. 155). Bodies are moved to or from each other, and this is performed according to different laws. The natural or mechanic philosopher endeavours to dis-

[1] As in Leibniz's theory of an *original* Providence, instead of a *constant* Providence. See the *Collection of Papers* between Leibniz and Samuel Clarke (pp. 4, 26–34, &c., which seems to be here in Berkeley's eye). So, too, in recent theories of cosmical evolution. Perhaps the question, which concerns the relations of the Universal Mind to time and change, is indeterminable by human intelligence.

[2] Faith or trust in the absolute supremacy of Active Reason in the universe explains our disposition to presuppose the constancy of natural order. The working force exemplified in the laws of the material world is accordingly divine, and nature is potentially supernatural.

[3] i. e. are, sensibly considered, resolvable into laws of motion, exemplified in the data of sense.

cover those laws by experiment and reasoning. But what is said of forces residing in bodies, whether attracting or repelling, is to be regarded only as a mathematical hypothesis, and not as any thing really existing in nature[1].

235. We are not therefore seriously to suppose, with certain mechanic philosophers, that the minute particles of bodies have real forces or powers, by which they act on each other, to produce the various phænomena in nature. The minute corpuscles are impelled and directed, that is to say, moved to and from each other, according to various rules or laws of motion. The laws of gravity, magnetism, and electricity are divers. And it is not known what other different rules or laws of motion might be established by the Author of nature. Some bodies approach together, others fly asunder, and perhaps some others do neither. When salt of tartar flows *per deliquium*, it is visible that the particles of water floating in the air are moved towards the particles of salt, and joined with them. And when we behold vulgar salt not to flow *per deliquium*, may we not conclude that the same law of nature and motion doth not obtain between its particles and those of the floating vapours? A drop of water assumes a round figure, because its parts are moved towards each other. But the particles of oil and vinegar have no such disposition to unite. And when flies walk in water, without wetting their feet, it is attributed to a repelling force or faculty in the flies' feet. But this is obscure, though the phænomenon be plain[2].

236. It is not improbable, and seems not unsupported by experiments, that, as in algebra, where positive quantities cease there negative begin, even so in mechanics, where attracting forces cease there repelling forces begin: or (to express it more properly) where bodies cease to be

[1] Cf. *De Motu*, sect. 67–70. Even if all changes in nature could be resolved by us under their natural laws of motion, the *laws* would be only effects, not the responsible Cause. The Active Reason that is omnipresent in all the laws of motions cannot be an effect of the motions themselves in which it is revealed.

[2] The so-called *arbitrariness* of the existing constitution of visible nature means its dependence, not on caprice, but on perfectly reasonable Will. It implies the ultimate dependence of the physical world upon the moral world, and so the ethical root of the Whole.

moved towards, they begin to be moved from each other. This Sir Isaac Newton infers from the production of air and vapours, whose particles fly asunder with such vehement force. We behold iron move towards the loadstone, straws towards amber, heavy bodies towards the earth. The laws of these motions are various. And when it is said that all the motions and changes in the great world arise from attraction—the elasticity of the air, the motion of water, the descent of heavy, and the ascent of light bodies, being all ascribed to the same principle; when from insensible attractions of most minute particles at the smallest distance are derived cohesion, dissolution, coagulation, animal secretion, fermentation, and all chemical operations; and when it is said that without such principles there never would have been any motion in the world, and without the continuance thereof all motion would cease; in all this we know or understand no more than that bodies are moved according to a certain order, and that they do not move themselves.

237. So likewise, how to explain all those various motions and effects, by the density and elasticity of æther, seems incomprehensible (sect. 153, 162). For instance, why should the acid particles draw those of water and repel each other? Why should some salts attract vapours in the air, and others not? Why should the particles of common salt repel each other, so as not to subside in water? Why should the most repellent particles be the most attractive upon contact? Or why should the repellent begin where the attractive faculty leaves off? These, and numberless other effects, seem inexplicable on mechanical principles; or otherwise than by recourse to a mind or spiritual agent (sect. 154, 220). Nor will it suffice from present phænomena and effects, through a chain of natural causes and subordinate blind agents, to trace a Divine Intellect as the remote[1] original cause, that first created the world, and then set it a going. We cannot make even one single step in accounting for the phænomena, without admitting the immediate presence and immediate action of an incorporeal agent, who connects, moves, and disposes

[1] Cf. the *Vindication of the New Theory of Vision*, which is charged with the conception of a sensibly manifested continuous Divine Providence, as contrasted with Epicurean agnosticism.

all things, according to such rules, and for such purposes, as seem good to him [1].

238. It is an old opinion, adopted by the moderns, that the elements and other natural bodies are changed each into other (sect. 148). Now, as the particles of different bodies are agitated by different forces, attracting and repelling, or, to speak more accurately, are moved by different laws, how can these forces or laws be changed, and this change accounted for by an elastic æther? Such a medium—distinct from light or fire—seemeth not to be made out by any proof, nor to be of any use in explaining the phænomena. But if there be any medium employed, as a subordinate cause or instrument in attraction, it would rather seem to be light (sect. 152, 156); since, by an experiment of Mr. Boyle's [2], amber, that shewed no sign of attraction in the shade, being placed where the sunbeams shone upon it, immediately attracted light bodies. Besides, it hath been discovered by Sir Isaac Newton [3], and an admirable discovery it was, that light is an heterogeneous medium, consisting of particles endued with original distinct properties (sect. 40, 181). And upon these, if I may venture to give my conjectures, it seemeth probable the specific properties of bodies, and the force of specific medicines, may depend [4]. Different sides of the same ray shall, one approach and the other recede from the Islandic crystal; can this be accounted for by the elasticity of a fine medium, or by the general laws of motion, or by any mechanical principles whatever? And if not, what should hinder but there may be specific medicines, whose operation depends not upon mechanical principles, how much soever that notion hath been exploded of late years?

239. Why may we not suppose certain idiosyncrasies, sympathies, oppositions, in the solids, or fluids, or animal spirit of a human body, with regard to the fine insensible

[1] No originating or responsible causes are found among the passive data of the senses. There is implied the agency of the Universal Power, and also of individual persons, who are free to do evil.

[2] See Boyle's *Works*, vol. V. p. 265.

[3] See *Optics*, Bk. I. Prop. 4.

[4] i. e. as their ultimate *physical cause* or *natural sign*. He takes Fire or Light, for these reasons, as scientifically preferable to elastic æther. Cf. sect. 217-219.

parts of minerals or vegetables, impregnated by rays of light of different properties; not depending on the different size, figure, number, solidity, or weight of those particles, nor on the general laws of motion, nor on the density or elasticity of a medium, but merely and altogether on the good pleasure of the Creator, in the original formation of things? From whence divers unaccountable and unforeseen motions may arise in the animal economy; from whence also various peculiar and specific virtues may be conceived to arise, residing in certain medicines, and not to be explained by mechanical principles. For, although the general known laws of motion are to be deemed mechanical, yet peculiar motions of the insensible parts, and peculiar properties depending thereon, are occult and specific.

240. The words attraction and repulsion may, in compliance with custom, be used where, accurately speaking, motion alone is meant. And in that sense it may be said that peculiar attractions or repulsions in the parts are attended with specific properties in the whole. The particles of light are vehemently moved to or from, retained, or rejected by, objects: which is the same thing as to say, with Sir Isaac Newton, that the particles of acids are endued with great attractive force (sect. 202), wherein their activity consists; whence fermentation and dissolution; and that the most repellent are, upon contact, the most attracting particles.

241. Gravity and fermentation are received for two most extensive principles. From fermentation are derived the motion and warmth of the heart and blood in animals, subterraneous heat, fires, and earthquakes, meteors, and changes in the atmosphere. And that attracting and repelling forces operate in the nutrition and dissolution of animal and vegetable bodies is the doctrine both of Hippocrates and Sir Isaac Newton. The former of these celebrated authors, in his Treatise concerning Diet or Regimen[1], observes that in the nourishment of man, one part repels and another attracts. And again in the same Treatise[2], two carpenters, saith he, saw a piece of timber: one draws, the other pushes: these two actions tend to one

[1] *Opera*, vol. I. p. 636 (ed. Lips. 1825). [2] *Ibid.* p. 642.

and the same end, though in a contrary direction, one up, the other down: this imitates the nature of man: πνεῦμα τὸ μὲν ἕλκει τὸ δὲ ὠθέει.

242. It is the general maxim of Hippocrates, that the manner wherein nature acts consisteth in attracting what is meet and good, and in repelling what is disagreeable or hurtful. He makes the whole of the animal economy to be administered by the faculties or powers of nature. Nature alone, saith he, sufficeth for all things to animals. She knows of herself what is necessary for them. Whence it is plain he means a conscious intelligent Nature, that presides and moves the æthereal spirit. And though he declares all things are accomplished on man by necessity, yet it is not a blind fate, or chain of mere corporeal causes, but a Divine Necessity, as he himself expressly calls it[1]. And what is this but an overruling Intelligent Power that disposeth of all things?

243. Attraction cannot produce, and in that sense account for, the phænomena, being itself one of the phænomena produced and to be accounted for (sect. 160, 235). Attraction is performed by different laws, and cannot therefore in all cases be the effect of the elasticity of one uniform medium. The phænomena of electrical bodies, the laws and variations of magnetism, and, not to mention other kinds, even gravity, are not explained by elasticity, a phænomenon not less obscure than itself. But then, although it shew not the Agent, yet it sheweth a rule and analogy in nature, to say, that the solid parts of animals are endued with attractive powers whereby from contiguous fluids they draw like to like; and that glands have peculiar powers attractive of peculiar juices (sect. 41). Nature seems better known and explained[2] by attractions and repulsions, than by those other mechanical principles of size, figure, and the like; that is, by Sir Isaac Newton, than Descartes. And natural philosophers excel, as they

[1] *Opera*, I. pp. 639–41; also p. 693. This notion of a *divine* necessity (ἀνάγκη θεία), distinguished from *blind* fate, was common among the Greeks. See e. g. Plato, *Timæus*, pp. 47, 48; Ps.-Plutarch, *De Placit. Philos.* Lib. I. c. 25, 26. Cf. Arist. *Metaph.* Lib. IV. c. 5, and the Ps. *De Mundo*, c. 6.

[2] i. e. in a merely *physical* explanation; which gives, not causation proper, but only signs and their significations, or, as we say, *natural laws*.

are more or less acquainted with the laws and methods observed by the Author of nature[1].

244. The size and shape of particles and general laws of motion can never explain the secretions, without the help of attraction, obscure perhaps as to its cause, but clear as a law. Numberless instances of this might be given. Lemery the younger[2] thought himself obliged to suppose the particles of light or fire (contrary to all reason) to be of a very gross kind, even greater than the pores of the burnt limestone, in order to account for their being detained or imprisoned therein; but this phænomenon is easily reduced to attraction. There would be no end of enumerating the like cases. The activity and force of æthereal spirit or fire, by the laws of attraction, is imparted to grosser particles (sect. 152, 163), and thereby wonderfully supports the economy of living bodies. By such peculiar compositions and attractions, it seems to be effected that denser fluids can pass where air itself cannot (as oil through leather), and therefore through the nicest and finest strainers of an animal or vegetable.

245. The ancients had some general conception of attracting and repelling powers (sect. 241, 242) as natural principles. Galilæi had particularly considered the attraction of gravity, and made some discovery of the laws thereof. But Sir Isaac Newton, by his singular penetration, profound knowledge in geometry and mechanics, and great exactness in experiments, hath cast a new light on natural science. The laws of attraction and repulsion were in many instances discovered, and first discovered, by him. He shewed their general extent; and therewith, as with a key, opened several deep secrets of nature, in the knowledge whereof he seems to have made a greater progress than all the sects of corpuscularians together

[1] This is to empty the material world of *its* imagined 'forces,' which cannot be distinguished by our senses from the ordered events that are presented to them. It is a refunding of the whole sense-presentable procession into implied Active Reason at its root, as its immanent Cause.

[2] Physician of Louis XV, and professor of chemistry in Paris. He maintained that Fire not only pervades sensible things, as their absolute and ingenerable element, but that it is diffused through their insensible interstices and through space. He made contributions to the Memoirs of the Academy, and, like his father, is distinguished in the annals of French chemistry.

had done before him. Nevertheless, *the principle of attraction itself* is not to be explained by physical or corporeal causes.

246. The Cartesians attempted to explain it by the *nisus* of a subtle element, receding from the centre of its motion, and impelling grosser bodies towards it. Sir Isaac Newton in his later thoughts seems (as was before observed) to have adopted somewhat not altogether foreign from this notion, ascribing that to his elastic medium (sect. 237, 238) which Descartes did to his second element. But the great men of antiquity resolved gravity into the immediate action of an intelligent incorporeal being[1]. To which also Sir Isaac Newton himself attests and subscribes: although he may perhaps sometimes be thought to forget himself, in his manner of speaking of physical agents, which in a strict sense are none at all; and in supposing real forces to exist in bodies, in which, to speak truly, attraction and repulsion should be considered only as tendencies or motions, that is, as mere effects, and their laws as laws of motion.

247. Though it be supposed the chief business of a natural philosopher to trace out causes from the effects, yet this is to be understood not of agents (sect. 155), but of principles; that is, of component parts, in one sense, or of laws or rules, in another. In strict truth, all *agents* are incorporeal; and as such are not properly of physical consideration. The astronomer, therefore, the mechanic, or the chemist, not as such, but by accident only, treat of real causes, agents, or efficients. Neither doth it seem, as is supposed by the greatest of mechanical philosophers, that the true way of proceeding in their science is, from known motions in nature to investigate the moving forces. Forasmuch as force is neither corporeal, nor belongs to any corporeal thing (sect. 220); nor yet to be discovered by experiments or mathematical reasonings, which reach no farther than discernible effects, and motions in things passive and moved.

248. *Vis* or force is to the soul what extension is to the body, saith St. Augustin, in his tract concerning the Quantity of the Soul[2]; and without force there is nothing

[1] Cf. *De Motu*, sect. 32.

[2] *De Quantitate Animæ*, c. 4, &c. The essential passivity of the material world is the constant re-

done or made, and consequently there can be no agent. Authority is not to decide in this case. Let any one consult his own notions and reason, as well as experience, concerning the origin of motion, and the respective natures, properties, and differences of soul and body, and he will, if I mistake not, evidently perceive, that there is nothing active in the latter[1]. Nor are they natural agents or corporeal forces which make the particles of bodies to cohere. Nor is it the business of experimental philosophers to find them out.

249. The mechanical philosopher, as hath been already observed, inquires properly concerning the rules and modes of operation alone, and not concerning the cause; forasmuch as nothing mechanical is or really can be a cause (sect. 236, 247). And although a mechanical or mathematical philosopher may speak of absolute space, absolute motion[2]; and of force as existing in bodies, causing such motion, and proportional thereto[3]; yet what these forces are, which are supposed to be lodged in bodies, to be impressed on bodies, to be multiplied, divided, and communicated from one body to another, and which seem to animate bodies like abstract spirits, or souls, hath been found very difficult, not to say impossible, for thinking men to conceive and explain; as may be seen by consulting Borellus *De Vi Percussionis*, and Torricelli in his *Lezioni Academiche*, among other authors[4].

250. Nor, if we consider the proclivity of mankind to realise their notions[5], will it seem strange that mechanic philosophers and geometricians should, like other men, be misled by prejudice, and take mathematical hypotheses

frain of Berkeley in all his works. It is the foundation of his distinction between ideas (or data of sense) and persons—between things (whose *esse* is *percipi*) and agents—in a word, between myself and Not-myself.

[1] This account of the origin of motion is the leading conclusion in the *De Motu*.

[2] *Absolute* space and motion, i. e. space and motion infinite in quantity, and not necessarily realised in percipient intelligence.

[3] True causation being, with Berkeley, alien to sensible things, and found only in minds, on whose perceptions the concrete reality of sensible things depends.

[4] [This subject is handled at large in my Latin tract *De Motu.*] —AUTHOR.

[5] 'realise their notions,' i. e. by supposing that abstract notions of natural philosophy, such as *force* or *power*, can be pictured in sensuous imagination.

for real beings existing in bodies, so far as even to make it the very aim and end of their science to compute or measure those phantoms; whereas it is very certain that nothing in truth can be measured or computed, besides the very effects or motions themselves. Sir Isaac Newton[1] asks, Have not the minute particles of bodies certain forces or powers by which they act on one another, as well as on the particles of light, for producing most of the phænomena in nature? But, in reality, those minute particles are only agitated according to certain laws of nature, by some other agent, wherein the force exists and not in them, which have only the motion; which motion in the body moved, the Peripatetics rightly judge to be a mere passion; but in the mover to be ἐνέργεια or act.

251. [2]It passeth with many, I know not how, that mechanical principles give a clear solution of the phænomena. The Democritic hypothesis, saith Dr. Cudworth[3], doth much more handsomely and intelligibly solve the phænomena, than that of Aristotle and Plato[4]. But, things rightly considered, perhaps it will be found not to solve any phænomenon at all: for all phænomena[5] are, to speak

[1] *Optics*, Bk. III. Qu. 31.

[2] Sect. 251–264 present, in a condensed form, what, with Berkeley, everywhere in his writings, is the true philosophy of the physical universe; according to which all data of sense, coexisting and successive, are regarded as a *Divine Language*—connected, not as proper causes and effects, but as signs and things signified. His philosophy virtually assumes, without explaining, the legitimacy of our faith in constant natural order.

[3] The passage is as follows:—'The whole Aristotelical system of philosophy is infinitely to be preferred before the whole Democritical; though the former hath been so much disparaged, and the other cried up of late amongst us. Because, though it cannot be denied but that the Democritic hypothesis doth much more handsomely and intelligibly solve the corporeal phænomena, yet in all other things which are of far the greater moment, it is rather a madness than a Philosophy.'—Cudworth's *Intellectual System*, Bk. I. ch. 1. sect. 45. The ancient lore collected in the *Intellectual System* may be compared with that collected in *Siris*. The intense recognition of the *divinity* of natural law, which distinguishes *Siris*, suggests Berkeley's favourite Hooker.

[4] For 'the hypothesis' of Aristotle and Plato, cf. sect. 266, 311–19.

[5] 'Phænomena,' throughout *Siris*, correspond to the 'ideas of sense' in the *Principles*. These are not perceptions, although their concrete reality depends upon their *being perceived*. They are that of which *a* soul or mind must be per-

truly, appearances in the soul or mind[1]; and it hath never been explained, nor can it be explained, how external bodies, figures, and motions, should produce an appearance in the mind. These principles, therefore, do not solve, if by solving is meant assigning the real, either efficient or final, cause of appearances; but only reduce them to general rules.

252. There is a certain analogy, constancy, and uniformity in the phænomena or appearances of nature, which are a foundation for general rules: and these are a grammar for the understanding of nature, or that series of effects in the visible world whereby we are enabled to foresee what will come to pass in the natural course of things[2]. Plotinus observes, in his third Ennead, that the art of presaging is in some sort the reading of natural letters denoting order, and that so far forth as analogy obtains in the universe, there may be vaticination[3]. And in reality, he that foretells the motions of the planets, or the effects of medicines, or the results of chemical or mechanical experiments, may be said to do it by *natural vaticination*[4].

cipient, to make them real, but they do not depend on my mind. *Phænomenon*, with this connotation, is a prominent term in *Siris*, and, for this reason, I have, in the text and in references, retained Berkeley's orthography.

[1] Their realisation, that is to say, involves the percipient experience of a living spirit.

[2] Sight is accordingly foresight, and the sense-symbolism of nature is charged with natural predictions, which physical science interprets when it discovers natural laws.

[3] Lib. III. c. 6. The original of this remarkable passage, which anticipates, and puts on a philosophic basis, the modern conception of *scientific prevision*, is as follows:— *Καὶ γὰρ οὐ τοῦ μάντεως τὸ διότι, ἀλλὰ τὸ ὅτι μόνον εἰπεῖν, καὶ ἡ τέχνη, ἀνάγνωσις φυσικῶν γραμμάτων καὶ τάξιν δηλούντων, καὶ οὐδαμοῦ πρὸς τὸ ἄτακτον ἀποκλινόντων, μᾶλλον δὲ καταμαρτυρούσης τῆς φορᾶς, καὶ εἰς φῶς ἀγούσης καὶ πρὶν παρ' αὐτῶν φανῆναι, οἷος ἕκαστος, καὶ ὅσα. . . . . Ἀναλογίᾳ δὲ σημαίνοντα τὰ ἄλλα τῷ τετηρηκότι, ἐπεὶ καὶ αἱ ἄλλαι μαντικαὶ τῷ ἀναλόγῳ. . . . . Εἰ τοίνυν ἀναλογία ἐν τῷ παντί, καὶ προειπεῖν ἔνι*, &c. This is according to the text of Creuzer. Plotinus treats sense-perceptions as obscure intuitions of that supersensible world of Absolute Reason in which obscurity disappears. Sometimes indeed he seems to divorce the former, as illusory and phantasmic, from true Intellectual Vision.

[4] The modern logic of physical induction is condensed in this and some following sections, which point to the metaphysical presupposition at its foundation.

253. We know a thing when we understand it; and we understand it when we can interpret or tell what it signifies[1]. Strictly, the sense knows nothing[2]. We perceive indeed sounds by hearing, and characters by sight. But we are not therefore said to understand them. After the same manner, the phænomena of nature are alike visible to all: but all have not alike learned the connexion of natural things, or understand what they signify, or know how to vaticinate by them. There is no question, saith Socrates in Theæteto[3], concerning that which *is* agreeable to each person; but concerning what will in time to come be agreeable, of which all men are not equally judges. He who foreknoweth what will be in every kind is the wisest. According to Socrates, you and the cook may judge of a dish on the table equally well; but while the dish is making, the cook can better foretell what will ensue from this or that manner of composing it. Nor is this manner of reasoning confined only to morals or politics, but extends also to natural science.

254. As the natural connexion of *signs* with *the things signified* is regular and constant, it forms a sort of rational discourse (sect. 152), and is therefore the immediate effect of an Intelligent Cause. This is agreeable to the philosophy of Plato, and other ancients. Plotinus[4] indeed saith, that which acts naturally is not intellection, but a certain power of moving matter, which doth not know but only do. And it must be owned that, as faculties are multiplied by philosophers according to their operations, the *will* may be distinguished from the *intellect*. But it will not therefore follow that the Will which operates

[1] To interpret anything *fully* is to shew *all* its relations to every natural thing and person in the universe; which implies Omniscience. Hence all human 'interpretation' of concrete reality is a venture of faith in the goodness of the Universal Power.

[2] 'Sense,' says Cudworth, 'cannot be the knowledge which comprehends a thing as it is. If Sense had [implied] no other power but this of passion or sensation (as Protagoras supposeth), there could then be no such thing as absolute truth or knowledge. But that hypothesis contradicts itself. For that which pronounceth that the sensible ideas of things *are* phantastical and relative, must itself be something superior to Sense, and able to judge what really and absolutely is and is not.' (*Eternal and Immutable Morality.*)

[3] P. 178.

[4] See the *Fourth Ennead*, Bk. IV. c. 13; also *Second Ennead*, Bk. III. c. 17.

in the course of nature is not conducted and applied by intellect, although it be granted that neither will understands, nor intellect wills. Therefore, the phænomena of nature, which strike on the senses and are understood by the mind, do form not only a magnificent spectacle, but also a most coherent, entertaining, and instructive Discourse; and to effect this, they are conducted, adjusted, and ranged by the greatest wisdom. This Language or Discourse is studied with different attention, and interpreted with different degrees of skill. But so far as men have studied and remarked its rules, and can interpret right, so far they may be said to be knowing in nature. A beast is like a man who hears a strange tongue but understands nothing[1].

255. Nature, saith the learned Doctor Cudworth[2], is not master of art or wisdom: nature is *ratio mersa et confusa;* reason immersed and plunged into matter, and as it were fuddled in it and confounded with it. But the formation of plants and animals, the motions of natural bodies, their various properties, appearances, and vicissitudes, in a word, the whole series of things in this visible world, which we call the Course of Nature, is so wisely managed and carried on that the most improved *human* reason cannot thoroughly comprehend even the least particle thereof; so far is it from seeming to be produced by fuddled or confounded reason[3].

256. Natural productions, it is true, are not all equally perfect. But neither doth it suit with the order of things, the structure of the universe, or the ends of Providence, that they should be so. General rules, we have seen (sect. 249, 252), are necessary to make the world intelligible: and from the constant observations of such rules,

[1] This is an application of Berkeley's conception of Visible signs to sensible signs of every kind—existing permanently only in and through Divine Action which they express; but, where imperfectly understood (as by men), in only an imperfect or blurred reality. Bacon's conception of the *interpretability* of Nature so far agrees with this. For Berkeley, compare the sentences introduced in *Alciphron*, Dial. IV. sect. 12, in the third edition.

[2] See *Intellectual System*, Bk. I. ch. 3. § 11, where Cudworth is referring to his 'plastic nature,' and apparently with some expressions of Plotinus in view. Divine, or perfect knowledge, he calls 'unbodied Reason.'

[3] See sect. 253, note 1.

natural evils will sometimes unavoidably ensue: things will be produced in a slow length of time, and arrive at different degrees of perfection.

257. It must be owned we are not conscious of the systole and diastole of the heart, or the motion of the diaphragm. It may not nevertheless be thence inferred, that unknowing nature can act regularly, as well as ourselves. The true inference is—that the self-thinking individual, or human person, is not the real author of those natural motions. And, in fact, no man blames *himself* if they are wrong, or values himself if they are right[1]. The same may be said of the fingers of a musician, which some object to be moved by habit which understands not; it being evident that what is done by rule must proceed from something that understands the rule; therefore, if not from the musician himself, from some other Active Intelligence, the same perhaps which governs bees and spiders, and moves the limbs of those who walk in their sleep[2].

258. Instruments, occasions, and signs (sect. 160) occur in, or rather make up, the whole visible Course of Nature. These, being no agents themselves, are under the direction of One Agent concerting all for one end, the Supreme Good. All those motions, whether in animal bodies, or in other parts of the system of nature, which are not effects of particular wills, seem to spring from the same general cause with the vegetation of plants—an æthereal spirit actuated by a Mind.

259. The first poets and theologers of Greece and the East considered the generation of things as ascribed

[1] His own free voluntary agency is thus, with Berkeley, the measure of the agency for which each person is responsible. Ethical judgment is here (by implication) taken as the *test* for distinguishing *agents* properly so called, from the physical laws according to which the Divine Agent proceeds in nature. Conscience forbids explanation of moral or immoral acts by natural law *only*, and points to the only concrete example of originating and responsible agency.

[2] Cf. sect. 277. So in Cudworth, *Intellectual System*, Bk. I. ch. 3. sect. 12–14. This suggests a vein of speculation in Aristotle's *Physics*; also modern discussions on unconscious mental agency. If our instincts and habits involve a rationality of which we individually are unconscious, this is not evidence that intelligence may be ultimately blind. Rather, it illustrates the omnipresence of Divine Reason in nature.

rather to a Divine cause, but the *physici* to natural causes, subordinate to, and directed still by a Divine; except some corporealists and mechanics, who vainly pretended to make a world without a God. The hidden force that unites, adjusts, and causeth all things to hang together, and move in harmony—which Orpheus and Empedocles styled Love—this principle of union is no blind principle, but acts with intellect. This Divine Love and Intellect are not themselves obvious to our view, or otherwise discerned than in their effects. Intellect enlightens, Love connects, and the Sovereign Good attracts all things[1].

260. All things are made for the Supreme Good, all things tend to that end: and we may be said to account for a thing, when we shew that it is so best. In the Phædon[2], Socrates declares it to be his opinion that he who supposed all things to have been disposed and ordered by a Mind (sect. 154, 160) should not pretend to assign any other cause of them[3]. He blames physiologers for attempting to account for phænomena, particularly for gravity and cohesion, by vortexes and æther; overlooking the τὸ ἀγαθόν and τὸ δέον, the strongest bond and cement which holds together all the parts of the universe[4], and not discerning the cause itself from those things which only attend it.

261. As in the microcosm, the constant regular tenor of the motions of the viscera and contained juices doth not hinder particular voluntary motions to be impressed by the mind on the animal spirit; even so, in the mundane system, the steady observance of certain laws of nature, in

[1] For Orpheus and Empedocles, in sect. 259, see Ritter and Preller, No. 170; Aristotle's *Physics*, VIII. 1.

[2] P. 97. On this philosophy, the office of physical inquiry is not, in any instance, to seek for another ultimate cause than the Divine. It has only to interpret (by referring them to their laws) the sensible signs in which Divine Thought and Power are expressed. Physical causation is simply divinely sustained relation of sensible signs.

[3] Nevertheless a progressive knowledge of *natural causes*, which are to us the signs of coming changes, on which human conduct and happiness depends, is indispensable for man in this embodied life. We are all practically involved in the network of a highly complex sense-symbolism.

[4] The rational ground of our interpretation of the natural and moral universe is—faith in τὸ ἀγαθόν and τὸ δέον.

the grosser masses and more conspicuous motions, doth not hinder but a voluntary agent may sometimes communicate particular impressions to the fine æthereal medium, which in the world answers the animal spirit in man. Which two (if they are two), although invisible and inconceivably small, yet seem the real latent springs whereby all the parts of this visible world are moved[1]; albeit they are not to be regarded as a true cause, but only an instrument, of motion; and the instrument, not as a help to the Creator, but only as a sign to the creature.

262. Plotinus supposeth that the Soul of the universe is not the original cause or author of the species, but receives them from Intellect, the true principle of order and distinction, the source and giver of forms[2]. Others consider the vegetative soul only as some lower faculty of a higher soul which animates the fiery æthereal spirit (sect. 178). As for the blots and defects which appear in the course of this world—which some have thought to proceed from a fatality or necessity in nature, and others from an evil principle—that same philosopher[3] observes, that it may be the Governing Reason produceth and ordaineth all those things; and, not intending that all parts should be equally good, maketh some worse than others by design: as all parts in an animal are not eyes; and in a city, comedy, or picture, all ranks, characters, and colours are not equal or alike; even so excesses, defects, and contrary qualities conspire to the beauty and harmony of the world.

263. It cannot be denied that, with respect to the Universe of things, we in this mortal state are like men educated in Plato's cave, looking on shadows with our backs turned to the light. But though our light be dim,

[1] The co-existence of 'natural law' and 'voluntary agency,' in consistency too with the Divine Rationality of the concrete whole, is one aspect of the perplexity in which the final problem involves a merely human intelligence. How can scientific prevision, which presupposes order, be reconciled with voluntary agency, free to do evil, and thus to create disorder?

[2] 'Soul,' here distinguished from 'Intellect,' is that by which the universe is immediately animated. Ficinus speaks of Intellect as the father, and Matter as the mother of the data of sense.

[3] Plotinus, *Third Ennead*, Lib. IX. c. 1.

and our situation bad, yet if the best use be made of both, perhaps something may be seen[1]. Proclus, in his Commentary on the Theology of Plato, observes there are two sorts of philosophers. The one placed Body first in the order of beings, and made the faculty of thinking depend thereupon, supposing that the principles of all things are corporeal: that Body most really or principally exists, and all other things in a secondary sense, and by virtue of that. Others, making all corporeal things to be dependent upon Soul or Mind, think this to exist in the first place and primary sense, and the being of Bodies to be altogether derived from, and presuppose that of the Mind[2].

264. Sense and experience acquaint us with the course and analogy of appearances or natural effects. Thought, reason, intellect introduce us into the knowledge of their causes. Sensible appearances, though of a flowing, unstable, and uncertain nature, yet having first occupied the mind, they do by an early prevention render the aftertask of thought more difficult; and, as they amuse the eyes and ears, and are more suited to vulgar uses and the mechanic arts of life, they easily obtain a preference, in the opinion of most men, to those superior principles, which are the later growth of the human mind arrived to maturity and perfection; but, not affecting the corporeal sense, are thought to be so far deficient in point of solidity and reality, *sensible* and *real*, to common apprehensions, being the same thing[3]. Although it be certain that the *principles* of science are neither objects of sense nor imagination; and that intellect and reason are alone the sure guides to truth[3].

[1] Compare this modest estimate of the intellectual faculty of man with the sanguine view suggested in the *Principles*.—Introduction, sect. 1–3.

[2] *In Platonis Theologiam*, Lib. I. c. 3. Human thought still oscillates between these extremes. Proclus lived in the fifth century, A. D.

[3] Cf. *Principles*, sect. 36, 89. In *Siris*, animated by the Platonic spi- es to a reflexive recognition of reality as forms in the 'principles of science'—the universal relations of Intellect—which are apprehended in Sense, presentative and representative, at the best, only in a dim and confused way. This section is a characteristic expression of Berkeley's later philosophy, influenced by Plato and Plotinus. In the *Principles*, he vindicates the mind-dependent reality of sensible things, which he now seems to disparage.

265. The successful curiosity of the present age, in arts, and experiments, and new systems, is apt to elate men, and make them overlook the Ancients. But, notwithstanding that the encouragement and purse of princes, and the united endeavours of great Societies in these later ages, have extended experimental and mechanical knowledge very far, yet it must be owned that the ancients too were not ignorant of many things (sect. 166, 167, 168, 241, 242, &c.), as well in physics as metaphysics, which perhaps are more generally, though not first, known in these modern times[1].

266. The Pythagoreans and Platonists had a notion of the true system of the world[2]. They allowed of mechanical principles, but actuated by soul or mind: they distinguished the primary qualities in bodies from the secondary, making the former to be physical causes[3]; and they understood

[1] In what follows (sect. 266–368) Berkeley vindicates, by the authority of Ancient Philosophers, Greek and Oriental, his conception of the concrete universe, as constantly dependent on, and ultimately explicable, substantially and causally, only in living Mind. He thus ascends from sense and sensuous imagination to the 'principles of Science,' those uncreated necessities of Intellect, through which the data of sense are intelligibly connected.

Not to speak of preceding historical inquirers, Hegel, Erdmann, Ueberweg, and Zeller have modified and extended the conception of Greek opinions and their concatenation, attainable by Berkeley.

[2] Sect. 100, 232, 251–254. The spirit of *Siris* is reflected in the pregnant summary of Greek philosophy given in sect. 266, 267.

[3] In the *First Dialogue between Hylas and Philonous* this distinction of qualities is referred to as unavailable in defence of abstract Matter. Both sorts, it is argued, are relative and mutable. Here the Pythagoreans and Platonists are praised for regarding the primary qualities as physical causes, or sensible signs, of the secondary. This is done perhaps on the principle that *visible and tangible extensions, and their relations* (because permanent, impersonal, and universally characteristic of sensible things), are more appropriately regarded as *signs* of transient tastes, smells, and sounds, than these last of the former. So-called secondary qualities (qualities proper) are thus referred, as (physical) effects, to the modes of sensible extent (primary qualities) with which they are severally connected by natural law; but not *vice versa*. The atomic theory of the material world, in part adopted by Locke, so far accords with this. With Plato, extension and its geometrical implicates are, it seems, the qualities exclusively regarded as irrelative or primary—true for all minds; all the others, including solidity, are relative to the conditions of sense in man. See *Timæus*, pp. 61–64.

physical causes in a right sense[1]: they saw that a Mind infinite in power, unextended, invisible, immortal, governed, connected, and contained all things[2]: they saw there was no such thing as real absolute space[3]: that mind, soul, or spirit truly and really exists[4]: that bodies exist only in a secondary and dependent sense[5]: that the soul is the place of forms: that the sensible qualities are to be regarded as acts only in the cause, and as passions in us[6]: they accurately considered the differences of intellect, rational soul, and sensitive soul, with their distinct acts of intellection, reasoning, and sensation[7], points wherein the Cartesians and their followers, who consider sensation as a mode of thinking, seem to have failed. They knew there was a subtle æther[8] pervading the whole mass of corporeal beings, and which was itself actually moved and directed by a mind: and that physical causes were only instruments, or rather marks and signs[9].

267. Those ancient philosophers understood the generation of animals to consist in the unfolding and distending of the minute imperceptible parts of pre-existing animalcules[10], which passeth for a modern discovery; this they took for the work of nature, but nature animate and intelligent (sect. 172): they understood that all things were alive and in motion[11]: they supposed a concord and discord, a union and disunion, in particles, some attracting, others repelling each other; and that those attractions and repulsions, so various, regular, and useful, could not be accounted for, but by an Intelligence presiding and directing all particular motions, for the conservation and benefit of the Whole[12].

268. The Egyptians, who impersonated nature, had made her a distinct principle, and even deified her under

[1] Cf. sect. 279, 288, 300, 320, 322–329.
[2] Cf. sect. 270, 271, 289, 242, 293, 304, 318.
[3] Cf. sect. 290–295.
[4] Cf. sect. 306, 311–318.
[5] Cf. sect. 269, 310, 328.
[6] Cf. sect. 289, 304.
[7] Sect. 275, 302–304.
[8] Cf. sect. 152, 166, 171, 177, 211, 277.
[9] Cf. sect. 155, 160, 231, 235, 247–249, 251–254.
[10] Cf. sect. 282.
[11] Cf. sect. 153, 276.
[12] Cf. sect. 162, 164, 165, 234, 237, 251, 271, 272.

the name of Isis. But Osiris was understood to be Mind or Reason, chief and sovereign of all. Osiris, if we may believe Plutarch[1], was the first, pure, unmixed, and holy principle, not discernible by the lower faculties; a glimpse whereof, like lightning darting forth, irradiates the understanding; with regard to which Plutarch adds, that Plato and Aristotle termed one part of philosophy ἐποπτικόν; to wit, when having soared above common mixed objects, and got beyond the precincts of sense and opinion, they arrive to contemplate the first and most simple Being, free from all matter and composition. This is that οὐσία ὄντως οὖσα of Plato, which employeth mind alone; which alone governs the [2 world]. And the soul is that which immediately informs and animates nature.

269. Although the Egyptians did symbolically represent the supreme Divinity sitting on a lotus[3], and that gesture hath been interpreted to signify the most holy and venerable Being to be utterly at rest reposing within himself; yet, for any thing that appears, this gesture might denote dignity as well as repose. And it cannot be denied, that Jamblichus[4], so knowing in the Egyptian notions, taught that there was an intellect that proceeded to generation, drawing forth the latent powers into light in the formation of things. Nor was this to be understood of an external world, subsisting in real absolute space; for it was a doctrine of those ancient sages, that Soul was the place of forms, as may be seen in the twelfth book of the arcane part of divine wisdom, according to the Egyptians[5]. This notion was embraced by divers philosophers of Greece, who may be supposed to have derived it from the same

[1] *Isis et Osiris*, c. 78; also Cudworth's *Intellectual System*, Bk. I. ch. 4. § 18. According to Ritter, Isis connected the transitory and phenomenal with Osiris or Absolute Deity — like the Λόγος of Philo. Cf. sect. 279 of *Siris*.

[2] 'soul'—in the first edition.

[3] See Wilkinson's *Manners of the Ancient Egyptians*. Lepsius and Bunsen have opened avenues into ancient Egypt which were closed to Berkeley.

[4] See the paraphrase by Ficinus of the work *De Mysteriis Ægyptiorum*, formerly attributed to Jamblicus.

[5] See Cudworth's *Intellectual System*, Bk. I. c. 4. § 18, where the Egyptian cosmogony and 'arcane' theology or metaphysics (ἀπόρρητος θεολογία) are discussed. The 'pretended Aristotlelick book,' *De Secretiore parte Divinæ Sapientiæ secundum Ægyptios*, is referred to by Cudworth.

source from whence many of their other opinions were drawn.

270. The doctrine of real, absolute, external Space[1] induced some modern philosophers[2] to conclude it was a part or attribute of God, or that God himself was space; inasmuch as incommunicable attributes of the Deity appeared to agree thereto, such as infinity, immutability, indivisibility, incorporeity, being uncreated, impassive, without beginning or ending; not considering that all these negative properties may belong to nothing. For, nothing hath no limits, cannot be moved, or changed, or divided, is neither created nor destroyed. A different way of thinking appears in the Hermaic as well as other writings of the ancients. With regard to absolute space, it is observed in the Asclepian Dialogue[3], that the word *space* or *place* hath by itself no meaning; and again, that it is impossible to understand what space alone or pure space is. And Plotinus acknowledgeth no place but soul or mind, expressly affirming that the soul is not in the

[1] Sect. 270-284 contrast the modern assumption of absolute Space, as well as blind Necessity or Fate, with the ancient and more spiritual doctrine of *anima mundi*; that immaterial but unconscious influence, with Plato intermediate between the archetypal Ideas and Matter, and with others the supreme vital force of the universe.

[2] e. g. Samuel Clarke. With Berkeley *this* Space is an empty negation. Sensible extension is the only actual space he recognises. Insensible Space, like insensible Matter, is for him a meaningless abstraction, 'a thing merely visionary' (sect. 271). Cf. *New Theory of Vision*, sect. 122-126; *Principles of Human Knowledge*, sect. 116, 117; *De Motu*, sect. 52-57, 63. The Space against which Berkeley argues is that of some ancient and many modern mechanical philosophers and mathematicians—a huge, infinitely extended, self-subsistent entity, supposed to condition all existence; so that everything in the universe must be extended, and spiritual or unextended beings are impossible, every thing consisting of *partes extra partes* necessarily 'external' to each other. According to the *Principles*, Space is sensible extension—created, not infinitely divisible, of which the original elements are contributed in touch and sight, founded upon established associations between what we see and what we touch. But according to *Siris* Space is 'neither a datum of sense, nor our intellectual notion,' and so is regarded otherwise than in the *Principles*.

[3] Asclepius, a reputed disciple of Hermes. The work referred to is the famous dialogue between Hermes and Asclepius, *De Natura Deorum*.

world, but the world in the soul. And farther, the place of the soul, saith he, is not body, but soul is in mind, and body in the soul. See the third chapter of the fifth book of the fifth Ennead.

271. Concerning absolute space, that phantom of the mechanic and geometrical philosophers (sect. 250), it may suffice to observe that it is neither perceived by any sense, nor proved by any reason, and was accordingly treated by the greatest of the ancients as a thing merely visionary. From the notion of absolute space springs that of absolute motion[1]; and in these are ultimately founded the notions of external existence, independence, necessity, and fate. Which Fate, the idol of many moderns, was by old philosophers differently understood, and in such a sense as not to destroy the αὐτεξούσιον of God or man. Parmenides, who thought all things to be made by necessity or fate, understood justice and Providence to be the same with fate; which, how fixed and cogent soever with respect to man, may yet be voluntary with respect to God. Empedocles declared fate to be a cause using principles and elements. Heraclitus taught that fate was the general reason that runs through the whole nature of the universe; which nature he supposed to be an æthereal body, the seed of the generation of all things. Plato held fate to be the eternal reason or law of nature. Chrysippus supposed that fate was a spiritual power which disposed the world in order; that it was the reason and law of those things which are administered by Providence[2].

272. All the foregoing notions of fate, as represented by Plutarch, do plainly shew that those ancient philosophers did not mean by fate, a blind, headlong, unintelligent

[1] [Our judgment in these matters is not to be overborne by a presumed evidence of mathematical notions and reasonings, since it is plain the mathematicians of this age embrace obscure notions, and uncertain opinions, and are puzzled about them, contradicting each other and disputing like other men: witness their doctrine of Fluxions, about which, within these ten years, I have seen published about twenty tracts and dissertations, whose authors being utterly at variance, and inconsistent with each other, instruct bystanders what to think of their pretensions to evidence.]—AUTHOR.

Berkeley of course refers in this note to the *Analyst* controversy, and repeats former conclusions.

[2] See Ps.-Plutarch, *De Placit. Philos.* Lib. I. cap. 25–28, for the opinions of those philosophers on Fate. Berkeley seems to have those chapters in his eye here.

principle, but an orderly settled course of things, conducted by a wise and provident Mind. And as for the Egyptian doctrine, it is indeed asserted in the Pimander, that all things are produced by fate[1]. But Jamblichus, who drew his notions from Egypt, affirms that the whole of things is not bound up in fate; but that there is a principle of the soul higher than nature, whereby we may be raised to a union with the gods, and exempt ourselves from fate[2]. And in the Asclepian Dialogue[3] it is expressly said that fate follows the decrees of God. And indeed, as all the motions in nature are evidently the product of reason (sect. 154), it should seem there is no room for necessity—in any other sense than that of a steady regular course.

273. Blind fate and blind chance are at bottom much the same thing, and one no more intelligible than the other. Such is the mutual relation, connexion, motion, and sympathy of the parts of this world, that they seem as it were animated and held together by one Soul: and such is their harmony, order, and regular course, as sheweth the soul to be governed and directed by a Mind. It was an opinion of remote antiquity that the World was an Animal (sect. 153, 172). If we may trust the Hermaic writings, the Egyptians thought all things did partake of life. This opinion was also so general and current among the Greeks that Plutarch[4] asserts all others held the world to be an Animal, and governed by Providence; except Leucippus, Democritus, and Epicurus. And although an Animal containing all bodies within itself could not be touched or sensibly affected from without[5], yet it is plain they attributed to it an inward sense and feeling, as well as appetites and aversions; and that from all the various

[1] The dialogue called *Pœmander*, which treats of nature in its ultimate relations to Divine Power and Wisdom, is the most memorable of the Hermic works. It is probably Neo-platonic, and of the fourth century after Christ, though long ascribed to the Egyptian Hermes. In the *Pœmander* the individuality of man seems lost in the Supreme Power.

[2] i. e. the spiritual principle in the human soul, in possession of which man is in the image of God. We have fragments of Jamblicus, *De Fato*, recovered from the Palatine MSS. (ed. 1668), and Ficinus, *De Mysteriis* (De Fato); also Proclus on Providence and Fate.

[3] Cap. 14, *De Fatis.*

[4] *De Placit. Philos.* Lib. II. c. 3.

[5] As it were extra-organically.

tones, actions, and passions of the universe, they suppose one symphony, one animal act and life to result.

274. Jamblichus[1] declares the world to be one Animal, in which the parts, however distant each from other, are nevertheless related and connected by one common nature. And he teacheth, what is also a received notion of the Pythagoreans and Platonics, that there is no chasm in nature[2], but a Chain or Scale of beings, rising by gentle uninterrupted gradations from the lowest to the highest, each nature being informed and perfected by the participation of a higher[3]. As air becomes igneous, so the purest fire becomes animal, and the animal soul becomes intellectual: which is to be understood not of the change of one nature into another, but of the connexion of different natures; each lower nature being, according to those philosophers, as it were a receptacle or subject for the next above it to reside and act in.

275. It is also the doctrine of Platonic philosophers, that Intellect is the very life of living things, the first principle and exemplar of all, from whence by different degrees are derived the inferior classes of life: first the rational[4], then the sensitive, after that the vegetal; but so as in the rational animal there is still somewhat intellectual, again in the sensitive there is somewhat rational, and in the vegetal somewhat sensitive, and lastly, in mixed bodies, as metals and minerals, somewhat of vegetation. By which means the whole is thought to be more perfectly connected. Which doctrine implies that all the faculties, instincts, and motions of inferior beings, in their

[1] *De Mysteriis*—Opinio Egyptiorum de Deo. See the relative Commentary of Ficinus.

[2] 'no chasm in nature,' i. e. natural order is continuous.

[3] The notion of a Chain (σειρά, dim. σειρίς, whence *Siris*) in nature, connecting the phenomena and events of the universe with one another, and with God, in a Cosmos or orderly system in which each phenomenon is rationally linked with every other, was not foreign to the ancient world. So Milton, *Par. Lost*, V. 469–490.

[4] i. e. *discursive reason*, as distinguished from *intuitive reason*, or Intellect proper.—The ancient notion of a graduated organic unity in the universe, referred to in this section—traversed by the Cartesian antithesis of thought and extension—conscious human agents and mechanically moved brutes—reappears in speculation of last, and still more of this century, e. g. Fichte's *Die Bestimmung des Menschen*, and in the favourite modern conception of evolution or development.

several respective subordinations, are derived from, and depend upon Mind and Intellect.

276. Both Stoics and Platonics held the world to be alive; though sometimes it be mentioned as a sentient animal, sometimes as a plant or vegetable[1]. But in this, notwithstanding what hath been surmised by some learned men, there seems to be no Atheism. For, so long as the world is supposed to be quickened by elementary fire or spirit, which is itself animated by soul, and directed by understanding, it follows that all parts thereof originally depend upon, and may be reduced unto the same indivisible stem or principle, to wit, a Supreme Mind; which is the concurrent doctrine of Pythagoreans, Platonics, and Stoics[2].

277. There is, according to those philosophers, a life infused throughout all things: the πῦρ νοερόν, πῦρ τεχνικόν, an intellectual and artificial fire (sect. 166, 168, 174, 175, &c.)—an inward principle, animal spirit, or natural life, producing and forming within as art doth without; regulating, moderating, and reconciling the various motions, qualities, and parts of this mundane system. By virtue of this life the great masses are held together in their orderly courses, as well as the minutest particles governed in their natural motions, according to the several laws of attraction, gravity, electricity, magnetism, and the rest. It is this gives instincts, teaches the spider her web, and the bee her honey. This it is that directs the roots of plants to draw forth juices from the earth, and the leaves and corticle vessels to separate and attract such particles of air, and elementary fire, as suit their respective natures[3].

278. Nature seems to be not otherwise distinguished from the *anima mundi* than as life is from soul[4], and, upon

[1] Cf. sect. 153. See Ps.-Plutarch, *De Placit. Philos.* Lib. I. c. 3; Diogenes Laert. Lib. VII.

[2] Faith in the absolute supremacy of Omnipotent Intelligence, is here recognised, under various forms of expression, as latent in the gradual evolution of vegetable into animal life, and of animal into rational and moral life. Evolution is a physically scientific, not an ultimate or philosophic conception; although moral and religious conceptions, and intellectually necessary truths may be developed in human consciousness under this law, as a condition of their development, the *results* evolved are unaccountable by this or any other natural law.

[3] Cf. sect. 257.

[4] 'Soul,' i.e. *animating principle*, as distinguished from its effects or manifestations that are presented

the principles of the oldest philosophers, may not improperly or incongruously be styled the life of the world. Some Platonics, indeed, regard life as the act of nature, in like manner as intellection is of the mind or intellect. As the First Intellect acts by understanding, so nature according to them acts or generates by living. But life is the act of the soul, and seems to be very nature itself, which is not the principle, but the result of another and higher principle, being a life resulting from soul, as cogitation from intellect.

279. If nature be [[1] supposed] the life of the world, animated by one soul, compacted into one frame, and directed or governed in all parts by one mind: this system cannot be accused of Atheism; though perhaps it may of mistake or impropriety. And yet, as one presiding Mind gives unity to the infinite aggregate of things, by a mutual communion of actions and passions, and an adjustment of parts, causing all to concur in one view to one and the same end—the ultimate and supreme good of the whole; it should seem reasonable to say, with Ocellus Lucanus [2] the Pythagorean, that as life holds together the bodies of animals, the cause whereof is the soul; and as a city is held together by concord, the cause whereof is law, even so the world is held together by harmony, the cause whereof is God. And in this sense the world or Universe may be considered either as one Animal or one city (sect. 172, 277).

280. Aristotle [3] disapproves the opinion of those who hold a soul to be diffused throughout the world; and for this reason, because the elements are not alive. Though

to our senses—all nature being, by the supposition, animated. Soul (ψυχή) was distinguished from body, on the one hand, and from reason (νοῦς), on the other—mediating between them. The ancient notion of the animation of the Universe appears, in one form or another, among the physical philosophers of the sixteenth and seventeenth centuries, for instance, Telesius and Campanella.

[1] Not in the early editions.

[2] Ocelli Lucani *De Legibus* (Fragmentum ex Stobæo Egl. Phys. Lib. I. cap. 16)—now rejected as spurious, with the other fragments attributed to Ocellus Lucanus. His teaching is apt to be identified with Hylozoism, or the conception of the universe as living Matter. Conscious life in man is then a transitory manifestation of the Matter, under certain conditions—all inconsistent with a fundamentally ethical or theistic conception of the Power for ever and finally at work.

[3] Cf. sect. 230.

perhaps it may not be easy to prove that blood and animal spirit are more alive in man, than water and fire in the world. That philosopher, in his books of the Soul[1], remarks upon an opinion set forth in the Orphics, of the soul's entering from the universe into living creatures being borne by winds—that this cannot be true of plants, or of certain animals which do not breathe. But air vessels are by later experiments allowed to be found in all plants and animals[2]. And air may in some sort not improperly be said to be the carrier or vehicle of the soul, inasmuch as it is the vehicle of fire, which is the spirit immediately moved and animated by the soul (sect. 163, 171).

281. The living fire, the living, omniform seminary of the world, and other expressions of the like nature, occurring in the Ancient and Platonic philosophy[3], how can they be understood exclusive of light or elemental fire, the particles of which are known to be heterogeneous, and, for aught we know, may some of them be organised, and, notwithstanding their wonderful minuteness, contain original seeds which, being formed and sown in a proper matrix, do gradually unfold and manifest themselves, still growing to a just proportion of the species.

282. May not this æthereal seminary, consistently with the notions of that philosophy which ascribed much of generation to celestial influence, be supposed to impregnate plants and animals with the first principles, the stamina, or those animalcules which Plato, in his *Timæus*[4], saith are invisible for their smallness, but, being sown in a proper matrix, are therein gradually distended and explicated by nourishment, and at length the animals brought forth to light? Which notion hath been revived and received of late years by many, who perhaps are not aware of its antiquity, or that it was to be found in Plato. Timæus Locrensis, in his book of the Soul of the World[5], supposeth even souls to be derived from the celestial luminaries, excepting only the rational or intellectual part.

[1] *De Anima*, Lib. I. c. 5.

[2] Cf. sect. 29.

[3] So also in Ficinus, in many passages.

[4] P. 91. This Platonic notion was revived by Leuwenhoeck (1632–1723), the Dutch naturalist. Cf. sect. 267, 283.

[5] Timæi Locri *De Anima Mundi*, cap. 4—now regarded as spurious

But what influence or influx is there from the celestial bodies which hath not light for its vehicle? (sect. 43).

283. What other nature there should be intermediate between the soul of the world (sect. 171) and this gross corporeal system, which might be the vehicle of life, or, to use the language of philosophers, might receive or be impressed with the forms of things, is difficult to comprehend. It is a vulgar remark, that the works of art do not bear a nice microscopical inspection, but the more helps are used, and the more nicely you pry into natural productions, the more do you discover of the fine mechanism of nature, which is endless or inexhaustible; new and other parts, more subtle and delicate than the precedent, still continuing to offer themselves to view. And these microscopical observations have confirmed the ancient theory concerning generation, delivered in the *Timæus* of Plato. But that theory or hypothesis, how agreeable soever to modern discoveries, is not alone sufficient to explain the phænomena, without the immediate action of a mind. And Ficinus, notwithstanding what himself and other Platonics say of a plastic nature, is obliged to own that with the mundane force or soul it is to be understood there is joined an intelligence, upon which the seminal nature constantly depends, and by which it is governed.

284. Alcinous, in his tract of the Doctrine of Plato[1], saith that God hath given the world both mind and soul: others include both in the word soul, and suppose the soul of the world to be God. Philo[2] appears to be of this opinion in several parts of his writings. And Virgil[3], who was no stranger to the Pythagorean and Platonic tenets, writes to the same purpose:

> Deum namque ire per omnes
> Terrasque, tractusque maris, cœlumque profundum.
> Hinc pecudes, armenta, viros, genus omne ferarum,
> Quemque sibi tenues nascentem arcessere vitas.

[1] The *De Doctrina Platonis* of Alcinous, cap. 14, an exposition of Platonism, at one time in high repute.

[2] The syncretism of Philo, the Jewish philosopher (a contemporary of Christ), is so little constructed upon consistent principle, that it is difficult to determine whether this opinion should be attributed to him. With the Stoics, he seems to ascribe the central activity in all change to Deity, and mere passivity to matter, in analogy with the suggestion of the text. On the other hand, the mysterious ineffability of Deity, and antithesis between God and the universe, are suggested by his writings.

[3] *Georg.* IV. 221–24.

Thus much the schools of Plato and Pythagoras seem agreed in, to wit, that the Soul of the World (sect. 153, 172), whether having a distinct mind of its own, or directed by a superior mind (sect. 154, 279), doth embrace all its parts, connect them by an invisible and indissoluble Chain, and preserve them ever well adjusted and in good order.

285. Naturalists[1], whose proper province it is to consider phænomena, experiments, mechanical organs and motions, principally regard the visible frame of things or corporeal world; supposing soul to be contained in body. And this hypothesis may be tolerated in physics, as it is not necessary in the arts of dialling or navigation to mention the true system or earth's motion. But those who, not content with sensible appearances, would penetrate into the real and true causes (the object of theology, metaphysics, or the *philosophia prima*[2]), will rectify this error, and speak of the world as contained by the soul, and not the soul by the world.

286. Aristotle hath observed there were indeed some who thought so grossly as to suppose the universe to be one only corporeal and extended nature: but in the first book of his *Metaphysics*[3] he justly remarks they were guilty of a great mistake; forasmuch as they took into their account the elements of corporeal beings alone, whereas there are incorporeal beings also in the universe; and while they attempted to assign the causes of generation and corruption, and account for the nature of all things, they did at the same time destroy the very cause of motion.

287. It is a doctrine among other speculations contained in the Hermaic writings—that all things are One. And it is not improbable that Orpheus, Parmenides, and others

[1] In sect. 285–296 the ultimate dependence of sensible things and space on all-containing and all-regulating Mind, 'the source of unity and identity, harmony and order, existence and stability' (sect. 295)—of which the doctrine of *anima mundi* is an imperfect adumbration—is further unfolded. *Anima mundi* involves the vitality of the universe, and would resolve physical cosmology into an expanded biology. See Pseudo-Plutarch, Lib. II. c. 35; also Bessarion, and Cudworth.

[2] Cf. sect. 263. With Aristotle these are one. See *Metaph.* Lib. VI. c. 1 and Lib. XI. c. 7.

[3] *Metaph.* Lib. I. c. 3.

among the Greeks, might have derived their notion of Τὸ Ἕν, THE ONE, from Egypt. Though that subtle metaphysician Parmenides, in his doctrine of ἓν ἕστως, seems to have added something of his own. If we suppose that one and the same Mind is the Universal Principle of order and harmony throughout the world, containing and connecting all its parts, and giving unity to the system, there seems to be nothing atheistical or impious in this supposition[1].

288. Number is no object of sense: it is an act of the mind. The same thing in a different conception is one or many[2]. Comprehending God and the creatures in one general notion, we may say that all things together make one universe, or τὸ πᾶν. But if we should say that all things make one God, this would, indeed, be an erroneous notion of God; but would not amount to Atheism, so long as Mind or Intellect was admitted to be the τὸ ἡγεμονικόν, the governing part[3]. It is, nevertheless, more respectful, and consequently the truer notion of God, to suppose him neither made up of parts, nor to be himself a part of any whole whatsoever.

289. All those who conceived the Universe to be an Animal must, in consequence of that notion, suppose all things to be One. But to conceive God to be the sentient soul of an animal is altogether unworthy and absurd. There is no sense nor sensory, nor any thing like a sense or sensory, in God. Sense implies an impression from some other being, and denotes a dependence in the soul which hath it. Sense is a passion: and passions imply imperfection. God knoweth all things, as pure mind or intellect; but nothing by sense, nor in nor through a sensory. Therefore to suppose a sensory of any kind—whether space[4] or any other—in God, would be very wrong, and lead us into false conceptions of His nature[5].

[1] Here and elsewhere in *Siris*, he is in sympathy with the conception of the immanence of Deity in nature, favoured by the Neoplatonists, and by the Alexandrian theologians with whom he became familiar in his later years.

[2] Cf. *Principles*, sect. 12, 13, 119-122.

[3] It is a theism, when so expressed, that is difficult to reconcile with free moral agency in the universe, unless we distinguish moral agents from 'things.'

[4] As Newton suggests.

[5] He accordingly rejects the supposition that the things of sense are perceived *sensibly* in the Divine

The presuming there was such a thing as real, absolute, uncreated space seems to have occasioned that modern mistake. But this presumption was without grounds[1].

290. Body is opposite to spirit or mind. We have a notion of spirit from thought and action. We have a notion of body from resistance[2]. So far forth as there is real power, there is spirit. So far forth as there is resistance, there is inability or want of power: that is, there is a negation of spirit. We are embodied, that is, we are clogged by weight, and hindered by resistance. But in respect of a perfect spirit, there is nothing hard or impenetrable: there is no resistance to the Deity: nor hath he any body: nor is the Supreme Being united to the world as the soul of an animal is to its body; which necessarily implieth defect, both as an instrument, and as a constant weight and impediment[3].

291. Thus much it consists with piety to say—that a Divine Agent doth by his virtue permeate and govern the elementary fire or light (sect. 157, 172), which serves as animal spirit to enliven and actuate the whole mass, and all the members of this visible world[4]. Nor is this doctrine

Intelligence, holding that in God they are realised in 'a wholly intellectual way,' whatever that means. The passivity characteristic of sense implies a reality that is independent of each individual percipient. It is thus that the events of sense, by their independence of my personal agency, awaken in me the sense of my own individual personality, rounded off by omnipresent Power other than my own.

[1] Cf. sect. 270, 271, 378, where Berkeley gives reasons for rejecting 'real, absolute, uncreated space.'

[2] Berkeley notes (passive) *resistance* and *solidity*, not *extension*, as the characteristic of body. So too in his early philosophical works. But how, under his conception of the reality of matter, are tangible realisations *more* real than visual or audible?

[3] He thus sees that the analogy between the relation of the soul of man to his body, and that of God to the universe, must be imperfect, in respect of the Divine omniscience and omnipotence; also in respect of the sentient beings and moral agents included in the universe, to which nothing corresponds in the human body.

[4] We have here a hint of the origin of Berkeley's inclination to the 'fire philosophy.' He seemed to, by this means, escape the need for conceiving God to be the *sentient* soul of the animal Universe. It is one of the many attempts to *unify* physics under one supreme dynamic law, immediately subordinate to God—thus harmonising our ultimate conception in physics with religious faith. The *anima mundi* of Plato, the *archæus* of Paracelsus, and the 'plastic nature' of Cudworth, may perhaps be

less philosophical than pious. We see all nature alive or in motion. We see water turned into air, and air rarefied and made elastic (sect. 149, 152, 200) by the attraction of another medium, more pure indeed, more subtle, and more volatile, than air. But still, as this is a moveable, extended, and consequently a corporeal being (sect. 207), it cannot be itself the principle of motion, but leads us naturally and necessarily to an incorporeal spirit or agent. We are conscious that a spirit can begin, alter, or determine motion; but nothing of this appears in body. Nay, the contrary is evident, both to experiment and reflexion.

292. Natural phænomena are only natural appearances. They are, therefore, such as we see and perceive them [1]. Their real and objective [2] natures are, therefore, the same: passive without anything active; fluent and changing without anything permanent in them. However, as these make the first impressions, and the mind takes her first flight and spring, as it were, by resting her foot on these objects, they are not only first considered by all men, but most considered by most men. They and the phantoms that result from those appearances—the children of imagination grafted upon sense—such for example as pure space (sect. 270), are thought by many the very first in existence and stability, and to embrace and comprehend all other beings.

293. Now, although such phantoms as *corporeal forces, absolute motions,* and *real spaces* do pass in physics for causes and principles (sect. 220, 249, 250), yet are they in truth but hypotheses; nor can they be the objects of real science [3]. They pass nevertheless in physics, conversant about things of Sense, and confined to experiments and mechanics. But when we enter the province of the *philosophia prima,* we discover another order of beings—Mind and its acts; permanent being; not dependent on corporeal things; nor resulting, nor connected, nor contained, but containing, connecting, enlivening the whole

similarly explained. Note what is said of 'sense' in sect. 259.

[1] They are in short only data of sense, to which we must attribute nothing that is not actually presented to the senses. This is the refrain also throughout the *De Motu.*

[2] 'objective' here means apparent or phenomenal.

[3] Cf. *De Motu,* which criticises those favourite abstractions of natural philosophers, and their working hypotheses.

frame; and imparting those motions, forms, qualities, and that order and symmetry, to all those transient phænomena, which we term the Course of Nature.

294. It is with our faculties as with our affections: what first seizes holds fast (sect. 264). It is a vulgar theme, that man is a compound of contrarieties, which breed a restless struggle in his nature, between flesh and spirit, the beast and the angel, earth and heaven, ever weighed down and ever bearing up[1]. During which conflict the character fluctuates: when either side prevails, it is then fixed for vice or virtue. And life from different principles takes a different issue. It is the same in regard to our faculties. Sense at first besets and overbears the mind. The sensible appearances are all in all: our reasonings are employed about them: our desires terminate in them: we look no farther for realities or causes; till Intellect begins to dawn, and cast a ray on this shadowy scene. We then perceive the true principle of unity, identity, and existence[2]. Those things that before seemed to constitute the whole of Being, upon taking an intellectual view of things, prove to be but fleeting phantoms.

295. From the outward form of gross masses which occupy the vulgar, a curious inquirer proceeds to examine the inward structure and minute parts, and, from observing the motions in nature, to discover the laws of those motions. By the way he frames his hypothesis, and suits his language to this natural philosophy. And these fit the occasion and answer the end of a maker of experiments or mechanic; who means only to apply the powers of nature, and reduce the phænomena to rules. But if, proceeding still in his analysis and inquiry, he ascends from the sensible into the intellectual world[3], and beholds things in a new light and a new order, he will then change his system, and perceive that what he took for substances and causes are but fleeting shadows: that the Mind contains all, and acts all, and is to all created beings the source of unity and identity, harmony and order, existence and stability[4].

[1] So Pascal in the *Pensées*.

[2] Namely, Spirit or Mind.

[3] Rising from science that is only physical to metaphysical philosophy.

[4] Compare this and what follows with Berkeley's juvenile jets of thought in his *Commonplace Book*, in which 'mind' seems almost to resolve into empirical data of

296. It is neither acid, nor salt, nor sulphur, nor air, nor æther, nor visible corporeal fire (sect. 155), much less the phantom Fate or Necessity, that is the real agent, but, by a certain analysis, a regular connexion and climax, we ascend through all those mediums to a glimpse of the First Mover, invisible, incorporeal, unextended, intellectual source of life and being. There is, it must be owned, a mixture of obscurity and prejudice in human speech and reasonings. This is unavoidable, since the veils of prejudice and error are slowly and singly taken off one by one. But, if there are many links in the Chain which connects the two extremes of what is grossly sensible and purely intelligible, and it seems a tedious work, by the slow helps of memory, imagination, and reason[1], oppressed and overwhelmed, as we are, by the senses, through erroneous principles, and long ambages of words and notions, to struggle upwards into the light of truth; yet, as this gradually dawns, farther discoveries still correct the style and clear up the notions.

297. The Mind her acts and faculties, furnish a new and distinct class of objects (sect. 163, 266), from the contemplation whereof arise certain other notions, principles, and verities, so remote from, and even so repugnant to, the first prejudices which surprise the sense of mankind that they may well be excluded from vulgar speech and books, as *abstract* from sensible matters, and more fit for the speculation of truth, the labour and aim of a few, than for the practice of the world, or the subjects of experimental or mechanical inquiry[2]. Nevertheless, though, perhaps, it may not be relished by some modern readers, yet the treating in physical books concerning metaphysical and divine matters can be justified by great authorities among the ancients: not to mention that he who professedly delivers the elements of a science is more obliged to method and system, and tied down to more rigorous

sense, and abstract intellectual necessities to be disparaged. 'Pure intellect I understand not. We must with the mob place certainty in the senses. Mind is a congeries of perceptions. Take away perceptions and you take away the mind. Put the perceptions and you put the mind. Sensual pleasure is the *summum bonum*.'

[1] 'reason' = discursive thought or reasoning, not intuitive reason.

[2] Former hostility to 'abstractions' seems abated here.

laws, than a mere essay writer. It may, therefore, be pardoned if this rude Essay doth, by insensible transitions, draw the reader into remote inquiries and speculations, that were not, [[1] perhaps,] thought of either by him or by the author at first setting out.

298. There are traces of profound thought as well as primeval tradition in the Platonic, Pythagorean, Egyptian, and Chaldaic philosophy (sect. 179, 266). Men in those early days were not overlaid with languages and literature. Their minds seem to have been more exercised, and less burdened, than in later ages; and, as so much nearer the beginning of the world, to have had the advantage of patriarchal lights handed down through a few hands[2]. It cannot be affirmed indeed (how probable soever it may seem) that Moses was that same Mochus, with whose successors, priests and prophets, Pythagoras is said to have conversed at Sidon. Yet the study of philosophy appears to be of very great antiquity and remote original; inasmuch as Timæus Locrensis, that ancient Pythagorean, author of the book concerning the Soul of the World[3], speaks of a most ancient philosophy, even in his time, ἀ πρεσβύστα φιλοσοφία, stirring up and recovering the soul from a state of ignorance to the contemplation of Divine things. And though the books attributed to Mercurius Trismegistus were none of them wrote by him, and are allowed to contain some manifest forgeries, yet it is also allowed that they contain tenets of the ancient Egyptian philosophy, though dressed, perhaps, in a more modern garb. To account for which, Jamblichus observes that the books under his name contain indeed mercurial opinions, though often expressed in the style of the Greek philosophers; as having been translated from the Egyptian tongue into Greek.

299. The difference of Isis from Osiris (sect. 268) resembles that of the moon from the sun; of the female from the male, of *natura naturata* (as the schoolmen speak) from *natura naturans*. But Isis, though mostly taken for

[1] Not in the early editions.

[2] In what respect is this supposed to be an 'advantage'? Cf. sect. 301, 339.

[3] *De Anima Mundi*, cap. V. § 15. But this work is probably of late date.

nature, yet (as the Pagan divinities were very fluctuating things) it sometimes signified τὸ πᾶν. And we find in Mountfaucon an Isis of the ordinary form with this inscription, Θεοῦ παντός. And in the *mensa Isiaca*, which seems to exhibit a general system of the religion and superstition of the Egyptians, Isis on her throne possesseth the centre of the table. Which may seem to signify that the universe or τὸ πᾶν was the centre of the ancient secret religion of the Egyptians; their Isis or τὸ πᾶν comprehending both Osiris the Author of nature and his work.

300. Plato and Aristotle considered God as abstracted or distinct from the natural world[1]. But the Egyptians considered God and nature as making one Whole, or all things together as making one Universe. In doing which they did not exclude the intelligent mind, but considered it as containing all things. Therefore, whatever was wrong in their way of thinking, it doth not, nevertheless, imply or lead to Atheism[2].

301. The human mind is so much clogged and borne downward, by the strong and early impressions of sense (sect. 264), that it is wonderful how the ancients should have made even such a progress, and seen so far into intellectual matters, without some glimmering of a divine tradition. Whoever considers a parcel of rude savages left to themselves, how they are sunk and swallowed up in sense and prejudice, and how unqualified by their natural force to emerge from this state, will be apt to think

[1] Cf. sect. 323. This is illustrated by passages in Plato, e. g. *Repub.* Lib. VI. pp. 506, 508. See *Aëria im Philebus die persönliche Gottheit des Plato, oder Plato kein Pantheist.* Von G. F. Rettig, Bern 1866. This writer founds on passages in the *Philebus*. As regards Aristotle the case is not so clear. He seems to distinguish God from nature, but hardly to regard Deity as personal. His universe is eternal, and necessarily developed according to abstract ideals or ends. See *Metaph.* XI. 6–10, and X. 7, where he identifies metaphysics with theology; also Ps. *De Mundo*, VI. § 30, and Ps.-Plutarch, *De Placit. Philos.* Lib. I. 7.

In his early writings Berkeley discusses what we ought to mean by the *reality* we attribute to matter. In *Siris*, and so far in *Alciphron*, he advances to the deeper question of the meaning of 'real' when applied to God, and what constitutes atheism; but with less in *Siris* than in *Alciphron* about verifying the reality of Divine Being by sense and its suggestions, and more about finding God in the constitution of intuitive reason.

[2] Cf. sect. 288.

that the first spark of philosophy was derived from heaven; and that it was (as a heathen writer expresseth it) *θεοπαράδοτος φιλοσοφία*

302. The lapsed state of human kind is a thing to which the ancient philosophers were not strangers[1]. The *λύσις*, the *φυγή*, the *παλιγγενεσία*, shew that the Egyptians and Pythagoreans, the Platonists and Stoics, had all some notion of this doctrine, the outlines of which seem to have been sketched out in those tenets[2]. Theology and philosophy gently unbind the ligaments that chain the soul down to the earth, and assist her flight towards the sovereign Good. There is an instinct or tendency of the mind upwards, which sheweth a natural endeavour to recover and raise ourselves from our present sensual and low condition, into a state of light, order, and purity.

303. The perceptions of sense are gross: but even in the senses there is a difference[3]. Though harmony and proportion are not objects of sense, yet the eye and the ear are organs which offer to the mind such materials by means whereof she may apprehend both the one and the other. By experiments of sense we become acquainted with the lower faculties of the soul; and from them, whether by a gradual (sect. 275) evolution or ascent, we arrive at the highest. Sense supplies images to memory. These become subjects for fancy to work upon. Reason considers and judges of the imaginations. And these acts of reason become new objects to the understanding. In this scale, each lower faculty is a step that leads to one above it. And the uppermost naturally leads to the Deity; which is rather the object of intellectual knowledge than even of the discursive faculty, not to mention the sensitive.

[1] *Phædo*, e. g. *Theætetus*, p. 176, *Timæus*, pp. 30, 86, &c. Evil, as Plato represents it, is due to apostacy from an original good.

[2] *Phædo*, pp. 82–84. So Plotinus, whose life was an endeavour to unite, by philosophy, the divine in man with all-pervading Deity.

[3] Sect. 303–319 are among the most pregnant in *Siris*, suggesting the contrast and correlation of Sense and Intellect; the evanescent character of our material world; the innate notions, latent in the necessary constitution of Intellect; the dependence of space and the whole sensible world upon Mind—all interspersed with references to Pythagoras, Plato, Aristotle, and other ancient authorities. The 'scale' in sect. 303, distinguishes in human knowledge the sense-presentative element

There runs a Chain throughout the whole system of beings. In this Chain one link drags another. The meanest things are connected with the highest. The calamity therefore is neither strange nor much to be complained of, if a low sensual reader shall, from mere love of the animal life, find himself drawn on, surprised and betrayed, into some curiosity concerning the intellectual.

304. There is, according to Plato, properly no knowledge, but only opinion concerning things sensible and perishing (sect. 263, 264); not because they are naturally abstruse and involved in darkness, but because their nature and existence are uncertain, ever fleeting and changing. Or rather, because they do not in strict truth exist at all, being always generating or *in fieri*, that is, in a perpetual flux, without any thing stable or permanent in them to constitute an object of real science. The Pythagoreans and Platonics distinguish between τὸ γιγνόμενον and τὸ ὄν, that which ever generated and that which exists. Sensible things and corporeal forms are perpetually producing and perishing, appearing and disappearing, never resting in one state, but always in motion and change; and therefore, in effect, not one being but a succession of beings: while τὸ ὄν is understood to be somewhat of an abstract or spiritual nature, and the proper object of intellectual knowledge. Therefore, as there can be no knowledge of things flowing and unstable, the opinion of Protagoras and Theætetus, that sense was science, is absurd[1]. And indeed nothing is more evident than that the apparent sizes and shapes, for instance, of things are in a constant flux, ever differing as they are viewed at different distances, or with glasses more or less accurate. As for those absolute magnitudes and figures, which certain Cartesians and other moderns suppose to be in things; that must seem a vain supposition; to whoever

(αἴσθησις); the representative, in memory and imagination (φαντασία); and discursive thought or inference (διάνοια)—all culminating in intuitive reason (νοῦς), and 'intellectual knowledge.' Logically distinguishable, these elements are in fact inseparable, although they appear in varying proportions in different persons, and in the same person at different times.

[1] *Theætetus*, p. 154. The reference is to the *homo mensura* of Protagoras, argued against by Plato, with whom God, not man, least of all any individual man, is the intellectual measure of the universe.

considers, it is supported by no argument of reason, and no experiment of sense.

305. As understanding perceiveth not, that is, doth not hear, or see, or feel, so sense knoweth not: and although the mind may use both sense and fancy, as means whereby to arrive at knowledge, yet sense or soul, so far forth as sensitive, knoweth nothing. For, as it is rightly observed in the *Theætetus* of Plato, science consists not in the passive perceptions, but in the reasoning upon them—τῷ περὶ ἐκείνων συλλογισμῷ [1].

306. In the ancient philosophy of Plato and Pythagoras, we find distinguished three sorts of objects:—In the first place, a form or species that is neither generated nor destroyed, unchangeable, invisible, and altogether imperceptible to sense, being only understood by the Intellect. A second sort there is, ever fluent and changing (sect. 292, 293), generating and perishing, appearing and vanishing; this is comprehended by Sense and Opinion. The third kind is Matter, which, as Plato teacheth, being neither an object of understanding nor of sense, is hardly to be made out by a certain spurious way of reasoning—λογισμῷ τινι νόθῳ μόγις πιστόν. (See his *Timæus* [2].) The same doctrine is contained in the Pythagoric treatise *De Anima Mundi* [3], which, distinguishing ideas, sensible things, and matter, maketh the first to be apprehended by Intellect, the second by Sense, and the last, to wit, Matter, λογισμῷ νόθῳ [4]. Whereof Themistius the Peripatetic [5] assigns the reason. For, saith he, that act is to be esteemed spurious, whose object hath nothing positive, being only

[1] *Theætetus*, p. 186. Sense is realised in thought; which last therefore cannot be derived from sense.

[2] Where he distinguishes indeterminate *materia prima* from the Divine Ideas, and from the Cosmos of determinate sensible things which results from their correlation.

[3] *De Anima Mundi*, cap. I. § 2, 6—formerly attributed to *Timæus* the Locrian. The words are:—Τὰ δὲ ξύμπαντα, ἰδέαν, ὕλαν, αἰσθητόν τε, οἷον ἐκγονον τουτέων. In the Platonic philosophy, the concrete sensible universe implies Idea or Form (τὸ εἶδος), and Matter (τὸ ἄπειρον and τὸ ἕτερον of Plato, and the πρώτη ὕλη of Aristotle). That phenomenal reality implies these two unphenomenal elements is an opinion with which Berkeley is, I think, more in sympathy in *Siris* than in his early works.

[4] What is here said of 'Matter' is elsewhere said of Space. Cf. sect. 319. It is 'the result of λογισμὸς νόθος.'

[5] P. 34, ed. Venet. 1554.

a mere privation, as silence or darkness. And such he accounteth Matter.

307. Aristotle maketh a threefold distinction of objects, according to the three speculative sciences. Physics he supposeth to be conversant about such things as have a principle of motion in themselves; Mathematics about things permanent but not abstracted; and Theology about Being abstracted and immoveable; which distinction may be seen in the ninth book of his *Metaphysics*[1]. Where by abstracted, χωριστόν, he understands separable from corporeal beings and sensible qualities.

308. That philosopher held that the mind of man was a *tabula rasa*[2], and that there were no innate ideas. Plato, on the contrary, held original ideas in the mind; that is, notions which never were or can be in the sense, such as being, beauty, goodness, likeness, parity. Some, perhaps, may think the truth to be this: that there are properly no *ideas*, or passive objects, in the mind but what were derived from sense: but that there are also besides these her own acts or operations; such are *notions*[3].

309. It is a maxim of the Platonic philosophy, that the soul of man was originally furnished with native inbred notions, and stands in need of sensible occasions, not absolutely for producing them, but only for awakening, rousing, or exciting into act what was already pre-existent, dormant, and latent in the soul; as things are said to be laid up in the memory, though not actually perceived until they happen to be called forth and brought into view by other objects. This notion seemeth somewhat different from that of innate ideas, as understood by those moderns who have attempted to explode them[4]. To understand

[1] See *Metaph.* Lib. V. c. 1; also Lib. X. c. 1.

[2] *De Anima*, Lib. III. c. 4. But the *tabula rasa* of Aristotle seems not inconsistent with the *potential* existence of tbe Ideas by which sensible things are determined—of which things the Ideas and potential Matter are co-constituents.

[3] In this section, we have a glimpse of Berkeley's later thoughts on Sense and Intellect—Matter and Idea—and their correlation—his later Idealism in short. The '*ideas* or passive objects,' of which Berkeley says so much in the *Principles* and the *Three Dialogues* of his Dublin life, are data of sense: *notions*, of which he began even then to speak, and the Divine Ideas of *Siris*, are latent in the mind of man, who participates in the Divine Intelligence.

[4] Especially Locke, who opens his *Essay* with an argument against 'innate ideas and principles,' ac-

and to be are, according to Parmenides, the same thing[1]. And Plato in his seventh Letter[2] makes no difference between *νοῦς* and *ἐπιστήμη*, mind and knowledge. Whence it follows that mind, knowledge, and notions, either in habit or in act, always go together.

310. And albeit Aristotle considered the soul in its original state as a blank paper[3], yet he held it to be the proper place of forms—*τὴν ψυχὴν εἶναι τόπον εἰδῶν* (sect. 269). Which doctrine, first maintained by others, he admits. under this restriction, that it is not to be understood of the whole soul, but only of the *νοητική*; as is to be seen in his third book *De Anima*[4]. Whence, according to Themistius in his commentary on that treatise, it may be inferred that all beings are in the soul. For, saith he, the forms are the beings. By the form every thing is what it is. And he adds, it is the soul that imparteth forms to matter; *τὴν ὕλην μορφῶσα ποικίλαις μορφαῖς*. Therefore they are first in the soul. He farther adds that the mind is all things, taking the forms of all things it becomes all things by intellect and sense. Alexander Aphrodisæus saith as much, affirming the mind to be all things, *κατά τε τὸ νοεῖν καὶ τὸ αἰσθάνεσθαι*. And this in fact is Aristotle's own doctrine, in his third book *De Anima*[5], where he also asserts, with Plato, that actual knowledge and the thing known are all one. Τὸ δ' *αὐτό ἐστιν ἡ κατ' ἐνέργειαν ἐπιστήμη τῷ πράγματι*. Whence it follows, that the things are where the knowledge is, that is to say, in the mind. Or, as it is otherwise expressed, that the soul is all things. More might be said to explain Aristotle's notion, but it would lead too far.

cording to his inadequate interpretation of innateness.

[1] *Frag.* V. 40, *τὸ αὐτὸ νοεῖν τε καὶ εἶναι.*

[2] P. 342. The *Epistles* are not now attributed to Plato.

[3] Cf. sect. 308, 315. So too Locke, 'Let us suppose the mind to be, as we say, white paper, void of all character, without any ideas—how comes it to be furnished?' *Essay*, II. 1. § 2. But Locke neglects Aristotle's distinction of potential and actual.

[4] C. 8, where Aristotle identifies the *αἰσθητικόν* with the *αἰσθητόν*, and the *ἐπιστημονικόν* with the *ἐπιστητόν*, through their forms (*εἴδη*)—the potential intellect being with him, as with Plato, the place of forms—*τόπος εἰδῶν*. For Themistius, see p. 35, ed. Venet. 1534.

[5] Cap. 7. See the preceding note. For the Aphrodisian, see *De Anima*, p. 139 (ed. Venet. 1534).

311. As to an absolute actual existence of sensible or corporeal things (sect. 264, 292, 294), it doth not seem to have been admitted either by Plato or Aristotle[1]. In the *Theætetus*[2] we are told that if any one saith a thing is, or is made, he must withal say, for what, or of what, or in respect of what, it is, or is made; for, that any thing should exist in itself or absolutely is absurd. Agreeably to which doctrine it is also farther affirmed by Plato, that it is impossible a thing should be sweet and sweet to nobody. It must, nevertheless, be owned with regard to Aristotle, that even in his *Metaphysics* there are some expressions which seem to favour the absolute existence of corporeal things. For instance, in the eleventh book[3], speaking of corporeal sensible things, what wonder, saith he, if they never appear to us the same, no more than to sick men; since we are always changing and never remain the same ourselves? And again, he saith, sensible things, although they receive no change in themselves, do nevertheless in sick persons produce different sensations and not the same. These passages would seem to imply a distinct and absolute existence of the objects of sense.

312. But it must be observed, that Aristotle distinguisheth a twofold existence—potential and actual. It will not therefore follow that, according to Aristotle, because a thing is, it must actually exist[4]. This is evident from the eighth book[5] of his *Metaphysics*, where he animadverts

[1] In sect. 311-319, Berkeley, in consideration of the transitoriness of the data of sense, and their implication of percipient sustaining mind, returns to the favourite problem of his youth—the meaning of *real existence* when predicated of the sensible world. He summons Plato and Aristotle as witnesses to the truth, that its existence is relative; that unperceived Matter and Space are absurd abstractions. Cf. *Principles of Human Knowledge*. 'Sensible things' are not to be confounded with the ἄπειρον of Plato, or the ὕλη of Aristotle.

[2] P. 160.

[3] The passage is in Lib. X. (XI.) cap. 6, where Aristotle argues against Protagoras, and in behalf of permanence in sensible things.

[4] For we cannot say that its *realisation* in individual percipients is necessarily implied in its *potential* existence in God.

[5] C. 3, in which potential (ἐν δυνάμει) is distinguished from actual existence (ἐν ἐνεργείᾳ, or ἐν ἐντελεχείᾳ); and the Megaric theory, limiting existence to the latter, is identified with the sceptical subjectivity of Protagoras. With Berkeley, when sensible things exist ἐν δυνάμει, they exist in the ever-living power of God. But what is to be understood by

on the Megaric philosophers, as not admitting a possible existence distinct from the actual: from whence, saith he, it must follow, that there *is* nothing cold, or hot, or sweet, or any sensible thing at all, where there is no *perception.* He adds that, in consequence of that Megaric doctrine, we can have no sense but while we actually exert it: we are blind when we do not see, and therefore both blind and deaf several times in a day.

313. The ἐντελέχειαι πρῶται of the Peripatetics, that is, the sciences, arts, and habits, were by them distinguished from the acts or ἐντελέχειαι δεύτεραι, and supposed to exist in the mind, though not exerted or put into act[1]. This seems to illustrate the manner in which Socrates, Plato, and their followers, conceive innate notions to be in the soul of man (sect. 309). It was the Platonic doctrine[2], that human souls or minds descended from above, and were sowed in generation; that they were stunned, stupified, and intoxicated by this descent and immersion into animal nature; and that the soul, in this ὀνείρωξις or slumber, forgets her original notions, which are smothered and oppressed by many false tenets and prejudices of sense. Insomuch that Proclus[3] compares the soul, in her descent invested with growing prejudices, to Glaucus diving to the bottom of the sea, and there contracting divers coats of seaweed, coral, and shells, which stick close to him, and conceal his true shape.

314. Hence, according to this philosophy, the mind of man is so restless to shake off that slumber, to disengage and emancipate herself from those prejudices and false opinions that so straitly beset and cling to her, to rub off those covers that disguise her original form, and to regain her primeval state and first notions: hence that perpetual struggle to recover the lost region of light, that ardent thirst and endeavour after truth and intellectual ideas; which she would neither seek to attain, nor rejoice in, nor know when attained, except she had some prenotion or

this sort of existence? Berkeley hardly recognises this question, and its difficulties for us.

[1] The *acquisition* of a habit implies previous potentiality, as well as the *manifestation* of the habit. Hence the first and second energies of the Peripatetics.

[2] *Timæus*, p. 52.

[3] *Comment. in Alcib. Plat. Prim.* —De Anima et Dæmone. A Latin edition by Ficinus, consisting of 'excerpta,' appeared in 1497, at Venice.

anticipation of them, and they had lain innate and dormant, like habits and sciences in the mind, or things laid up, which are called out and roused by recollection or reminiscence. So that learning seemeth in effect reminiscence[1].

315. The Peripatetics themselves distinguish between reminiscence and mere memory. Themistius observes that the best memories commonly go with the worst parts; but that reminiscence is most perfect in the most ingenious minds. And, notwithstanding the *tabula rasa* of Aristotle (sect. 308), yet some of his followers have undertaken to make him speak Plato's sense. Thus Plutarch the Peripatetic teacheth, as agreeable to his master's doctrine, that learning is reminiscence, and that the νοῦς καθ' ἕξιν is in children. Simplicius also, in his commentary on the third book of Aristotle, περὶ ψυχῆς, speaketh of a certain interior reason in the soul, acting of itself, and originally full of its own proper notions, πλήρης ἀφ' ἑαυτοῦ τῶν οἰκείων γνωσίων[2].

316. And, as the Platonic philosophy supposed intellectual notions to be originally inexistent, or innate in the soul (sect. 309, 314), so likewise it supposed sensible qualities to exist (though not originally) in the soul, and there only[3]. Socrates saith to Theætetus[4], You must not think the white colour that you see is in any thing without your eyes, or in your eyes, or in any place at all. And in the *Timæus*[5], Plato teacheth that the figure and motion of the particles of fire dividing the parts of our bodies

[1] On the Platonic doctrine, it follows that we *remember*, by contingent association, the contingencies of sense-experience; we are *reminiscent* of the 'intellectual ideas' or necessities that can be evolved by reflexion.

[2] In connexion with this section, see Themistius, *In De Memoria et Reminiscentia*, fol. 97 (ed. Venet. 1534); and Simplicius, *De Anima*, Lib. III. c. 9. To Simplicius, who lived in the sixth century, we owe valuable expositions of Aristotle, especially the *De Anima*. He attempts to reconcile Aristotle with Plato. 'Plutarch the Peripatetic' seems to be Plutarch son of Nestorius, the Neo-platonist, who is said to have written a commentary, now lost, on the *De Anima*. With Aristotle, reminiscence (ἀνάμνησις) implies, I think, not all that Plato symbolised by reminiscence of a life before birth.

[3] 'there' does not imply locality —*spacial* relation. Cf. sect. 329. The forms of knowledge are latent in sensuous perception: pure sensation is negation.

[4] *Theætetus*, pp. 184, 185.

[5] Pp. 61, 62.

produce that painful sensation we call heat. And Plotinus, in the sixth book of his second Ennead[1], observes that heat and other qualities are not qualities in the things themselves, but acts: that heat is not a quality, but act in the fire: that fire is not really what we perceive in the qualities, light, heat, and colour. From all which it is plain that whatever real things they suppose to exist independent of the soul, those were neither sensible things nor clothed with sensible qualities.

317. Neither Plato nor Aristotle by Matter, ὕλη, understood corporeal substance, whatever the moderns may understand by that word[2]. To them certainly it signified no positive actual being. Aristotle[3] describes it as made up of negatives, having neither quantity, nor quality, nor essence. And not only the Platonists and Pythagoreans, but also the Peripatetics themselves declare it to be known, neither by sense, nor by any direct and just reasoning, but only by some spurious or adulterine method, as hath been observed before. Simon Portius[4], a famous Peripatetic of the sixteenth century, denies it to be any substance at all; for, saith he, *Nequit per se subsistere, quia sequeretur, id quod non est in actu esse in actu.* If Jamblichus[5] may be credited, the Egyptians supposed Matter so far from including aught of substance or essence, that, according to them, God produced it by a separation from all substance, essence, or being, ἀπὸ οὐσιότητος ἀποχισθείσης ὑλότητος. That Matter is actually nothing, but potentially all things, is the doctrine of Aristotle, Theophrastus, and all the ancient Peripatetics[6].

318. According to those philosophers, Matter is only a *pura potentia*, a mere possibility. But Anaximander, successor to Thales, is represented as having thought

[1] Cap. 3.

[2] τὸ ἄπειρον, or τὸ ἕτερον of Plato—according to Hegel, a necessitated 'otherness.' What is popularly meant by matter, i. e. sensible things, is not to be confounded with the formless Matter of Aristotle—that dark, undefinable presupposition underlying this ordered world.

[3] *Metaph.* Lib. VI. c. 3.

[4] See the *De Rerum Naturalium Principiis* (1551), Lib. I. c. 11, of Simon Porta or Portius—a Neapolitan Professor of Philosophy at Pisa, and the most famous of the pupils of Pomponatius.

[5] *De Ægyptiorum Mysteriis.* See the paraphrase of Ficinus.

[6] *Metaph.* Lib. VI. c. 7. 15, Lib. VII. c. 1; *De Anima*, Lib. III. c. 5.

the supreme Deity to be infinite Matter. Nevertheless, though Plutarch[1] calleth it Matter, yet it was simply τὸ ἄπειρον, which means no more than infinite or indefinite. And although the moderns teach that Space is real and infinitely extended, yet, if we consider that it is no intellectual notion[2], nor yet perceived by any of our senses, we shall perhaps be inclined to think with Plato in his *Timæus*, that this also is the result of λογισμὸς νόθος, or spurious reasoning, and a kind of waking dream. Plato observes that we dream, as it were, when we think of place, and believe it necessary that whatever exists should exist in some place. Which place or space (sect. 250, 270), he also observes, is μετ' ἀναισθησίας ἁπτόν, that is, to be felt as darkness is seen, or silence heard, being a mere privation.

319. If any one should think to infer the reality, or actual being, of Matter from the modern tenet, that gravity is always proportionable to the quantity of matter, let him but narrowly scan the modern demonstration of that tenet, and he will find it to be a vain circle, concluding in truth no more than this—that gravity is proportionable to weight, that is, to itself. Since Matter is conceived only as defect and mere possibility; and since God is absolute perfection and act; it follows there is the greatest distance and opposition imaginable between God and Matter. Insomuch that a material God would be altogether inconsistent.

320. The force that produces, the intellect that orders, the goodness that perfects all things is the Supreme Being[3]. Evil, defect, negation, is not the object of God's

[1] *De Placit. Philos.* Lib. I. c. 3.

[2] With Berkeley *intellectual notions* and *ideas of sense* are constituent elements of our knowledge. In his early philosophy, he concerned himself chiefly with the former; in *Siris* with the latter. In his later as in his earlier philosophy he teaches that absolute Space is a negation; actualised in sensible extension—created—and dependent for its actual reality upon percipient mind. For Plato, see *Timæus*, p. 52; and cf. sect. 306.

[3] Sect. 320–329, in accumulating authorities favourable to the reference of all change ultimately to spiritual agency, suggest the manner of the relation of the physical Cosmos to the Universal Power; also the elasticity of our theistic conception, adapted to theological eclecticism, and to tolerance of diversity in theological expression. They also revert to the *anima mundi*.

creative power. From motion the Peripatetics trace out a first immoveable Mover. The Platonics make God author of all good, author of no evil, and unchangeable [1]. According to Anaxagoras, there was a confused mass of all things in one chaos; but Mind supervening, ἐπελθών, distinguished and divided them. Anaxagoras, it seems, ascribed the motive faculty to mind [2]; which mind some subsequent philosophers have accurately discriminated from soul and life, ascribing to it the sole faculty of intellection.

321. But still God was supposed the first Agent, the source and original of all things; which he produceth, not occasionally or instrumentally, but with actual and real efficacy. Thus the treatise *De Secretiore Parte Divinæ Sapientiæ secundum Ægyptios*, in the tenth book, saith of God, that he is not only the first Agent, but also that he it is who truly acts or creates, *qui vere efficit.*

322. Varro, Tully, and St. Augustin, understand the soul to be *vis*; the power or force that acts, moves, enlivens. Now although, in our conception, *vis*, or spirit, might be distinguished from mind, it would not thence follow that it acts blindly or without mind, or that it is not closely connected with intellect. If Plutarch [3] is to be trusted in his account of the opinions of philosophers, Thales held the mind of the world to be God; Democritus held the soul of the world to be an igniform deity (sect. 166, 168, 277); Pythagoras taught that God was the monad and the good, or τ' Ἀγαθόν; Socrates also and Plato pronounced him to be τὸ Ἕν (sect. 287), the single, self-originate One, essentially good. Each of which appellations and forms of speech directly tends to and determines in Mind, εἰς τὸν νοῦν σπεύδει, saith Plutarch.

323. Whence that author concludes, that, in the sense of those philosophers, God is a Mind, χωριστὸν εἶδος; not an abstract idea compounded of inconsistencies, and prescinded from all real things, as some moderns understand

[1] *Timæus*, pp. 29, 30. Whence then comes the suffering and moral evil which perplex us on this planet? Is it not through the power of *persons* to do evil, which is implied in the universe being a moral economy, for the progressive education of persons in goodness?

[2] i. e. νοῦς. See Diogen. Laert. Lib. II. c. 6; also Ps.-Plutarch, *De Placit.* Lib. I. c. 3.

[3] *De Placit. Philos.* Lib. I. c. 7; also Arist. *De Anima*, Lib. I. c. 2.

abstraction[1]; but a really existing Spirit, distinct or separate from all sensible and corporeal beings. And although the Stoics are represented as holding a corporeal deity, or that the very system of the world is God, yet it is certain they did not, at bottom, dissent from the forementioned doctrine; inasmuch as they supposed the world to be an animal (sect. 276, 279) consisting of soul or mind, as well as body.

324. This notion was derived from the Pythagoreans, who held the world, as Timæus Locrus[2] teacheth, to be one perfect animal, endued with soul and reason: but then they believed it to have been generated: whereas the Stoics looked on the world as the Supreme God, including therein mind or intellect. For the elementary fire, or, if one may so speak, the animal spirit of the world, seemeth, according to them, to have been the *vehicle* of the soul of the world[3] (sect. 277, 284), since they styled the Divinity πῦρ νοερόν (sect. 272), or intellectual fire.

325. The Egyptians, if we may credit the Hermaic writings, maintained God to be all things, not only actual, but possible. He is styled by them, That which is made and that which is unmade. And therein it is said, Shall I praise thee for those things thou hast made manifest, or for the things thou hast hidden? Therefore, in their sense, to manifest was to create; the things created having been before hidden in God.

326. Now, whether the νοῦς be abstracted from the sensible world, and considered by itself, as distinct from and presiding over the created system; or whether the whole Universe, including mind together with the mundane body, is conceived to be God (sect. 300), and the creatures to be partial manifestations of the Divine essence—there is no Atheism in either case, whatever misconceptions there may be; so long as Mind or Intellect is understood to preside over, govern, and conduct, the whole frame of things[4]. And this was the general prevailing opinion among the philosophers.

[1] Cf. *Principles*, Introd. sect. 6-17. See Arist. *Metaph.* Lib. XI. c. 7, 12.

[2] *De Anima Mundi*, cap. 2. See also Ps.-Plutarch, *De Placit. Philos.* Lib. I. c. 11. Cf. sect. 153 of *Siris*.

[3] 'and soul itself the vehicle of intellect or νοῦς'—in first edition.

[4] Cf. sect. 287, 300. We find similar language in the Alexandrian

327. Nor if any one, with Aristotle in his *Metaphysics*[1], should deny that God knows anything without himself—seeing that God comprehends all things, could this be justly pronounced an atheistical opinion. Nor even was the following notion of the same author to be accounted Atheism, to wit that there are some things beneath the knowledge of God, as too mean, base, and vile; however wrong this notion may be, and unworthy of the Divine perfection[2].

328. Might we not conceive that God may be said to be All in divers senses;—as he is the cause and origin of all beings; as the νοῦς is the νοητά, a doctrine both of Platonics and Peripatetics (sect. 309, 310); as the νοῦς is the place of all forms; and as it is the same which comprehends and orders (sect. 320) and sustains the whole mundane system. Aristotle declares that the Divine force or influence permeates the entire universe (sect. 173), and that what the pilot is in a ship, the driver in a chariot, the precentor in a choir, the law in a city, the general in an army, the same God is in the world[3]. This he amply sets forth in his book *De Mundo*; a treatise which, having been anciently ascribed to him, ought not to be set aside from the difference of style; which (as Patricius rightly observes), being in a letter to a king, might well be supposed to differ from the other dry and crabbed parts of his writings[4].

329. And, although there are some expressions to be

Fathers, and in Cudworth. Berkeley is satisfied to conceive God as immanent in nature and in spirit; provided there is practical acknowledgement of perfect Intelligence at the heart of the universe, the physical necessarily subordinate to the spiritual.

[1] Lib. XI. c. 6-9.

[2] Theism involves the absolute universality of Divine Providence or the adaptation of *all* that exists and happens to the Divine Ideal of progressive goodness in moral agents. Nothing accordingly can be too insignificant for recognition in the providential moral order.

[3] That God is Order (physical and moral) vivified or personified, not capricious interference with Order, is the profound lesson at once of philosophy and true religion. This theistic faith is *virtually* postulated in all human experience.

[4] Cap. VI. § 34. As already said, the *De Mundo* is not accepted as genuine. But see the reference to it in Cudworth's *Intellectual System*, Bk. IV. c. 26. Patricius (1529-97) was one of the Christian Platonists of his day, and a critical expositor of Aristotle. In his *Discussiones Peripateticæ*, he refers to the *De Mundo*.

met with in the philosophers, even of the Platonic and Aristotelic sects, which speak of God as mixing with, or pervading all nature and all the elements; yet this must be explained by force, and not by extension, which was never attributed to the mind (sect. 290, 293, 297, 319), either by Aristotle or Plato. This they always affirmed to be incorporeal: and, as Plotinus remarks[1], incorporeal things are distant each from other not by place, but (to use his expression) by *alterity*.

330. These disquisitions will probably seem dry and useless to such readers as are accustomed to consider only sensible objects. The employment of the mind on things purely intellectual is to most men irksome; whereas the sensitive powers, by constant use, acquire strength. Hence, the objects of sense more forcibly affect us (sect. 264, 294), and are too often counted the chief good. For these things men fight, cheat, and scramble. Therefore, in order to tame mankind, and introduce a sense of virtue, the best human means is to exercise their understanding, to give them a glimpse of another world, superior to the sensible, and, while they take pains to cherish and maintain the animal life, to teach them not to neglect the intellectual.

331. Prevailing studies are of no small consequence to a state, the religion, manners, and civil government of a country ever taking some bias from its philosophy; which affects not only the minds of its professors and students, but also the opinions of all the better sort, and the practice of the whole people, remotely and consequentially indeed, though not inconsiderably. Have not the polemic and scholastic philosophy been observed to produce controversies in law and religion? And have not Fatalism and Sadducism gained ground, during the general passion for the corpuscularian and mechanical philosophy, which hath prevailed for about a century? This, indeed, might usefully enough have employed some share of the leisure and curiosity of inquisitive persons. But when it entered the seminaries of learning, as a

[1] *Third Ennead*, Lib. VI. c. 15, 'by alterity,' τῇ ἑτερότητι—a remarkable term.

necessary accomplishment and most important part of education, by engrossing men's thoughts, and fixing their minds so much on corporeal objects, and the laws of motion, it hath, however undesignedly, indirectly, and by accident, yet not a little, indisposed them for spiritual, moral, and intellectual matters. Certainly had the philosophy of Socrates and Pythagoras prevailed in this age, among those who think themselves too wise to receive the dictates of the Gospel, we should not have seen interest take so general and fast hold on the minds of men, nor public spirit reputed to be γενναῖαν εὐήθειαν, a generous folly, among those who are reckoned to be the most knowing as well as the most getting part of mankind[1].

332. It might very well be thought serious trifling to tell my readers that the greatest men had ever a high esteem for Plato; whose writings are the touchstone[2] of a hasty and shallow mind; whose philosophy has been the admiration of ages; which supplied patriots, magistrates, and lawgivers to the most flourishing states, as well as fathers to the Church, and doctors to the schools. Albeit in these days the depths of that old learning are rarely fathomed; and yet it were happy for these lands if our young nobility and gentry, instead of modern maxims, would imbibe the notions of the great men of antiquity. But, in these freethinking times, many an empty head is shook at Aristotle and Plato, as well as at the Holy Scriptures. And the writings of those celebrated ancients are by most men treated on a foot with the dry and barbarous lucubrations of the schoolmen. It may be modestly presumed there are not many among us, even of those who are called the better sort, who have more sense, virtue, and love of their country than Cicero, who in a Letter to Atticus[3] could not forbear exclaiming,

[1] The eloquent appeal on behalf of a Spiritual, as contrasted with the, then and now, prevalent Mechanical, or Materialistic Philosophy, and the eloge of Plato, contained in this and the next section, is the prelude to the fragments of Platonic and Neo-platonic speculation regarding Triune Divine Being, which occupy the remaining sections of *Siris*.

[2] Sir J. Mackintosh applies this term to Berkeley's own philosophy. 'His immaterialism is chiefly valuable as a *touchstone* of metaphysical sagacity' (*Diss.* p. 208).

[3] *Epist.* XIV. 9.

O Socrates et Socratici viri! nunquam vobis gratiam referam. Would to God many of our countrymen had the same obligations to those Socratic writers! Certainly, where the people are well educated, the art of piloting a state is best learned from the writings of Plato. But among bad men, void of discipline and education, Plato, Pythagoras, and Aristotle themselves, were they living, could do but little good. Plato hath drawn a very humourous and instructive picture of such a state; which I shall not transcribe for certain reasons[1]. But whoever has a mind may see it, in the seventy-eighth page of the second tome of Aldus's edition of Plato's works.

333. Proclus, in the first book[2] of his Commentary on the Theology of Plato, observes that, as in the mysteries, those who are initiated at first meet with manifold and multiform gods, but, being entered and thoroughly initiated, they receive the Divine illumination, and participate the very Deity: in like manner, if the soul look abroad, she beholds the shadows and images of things; but returning into herself, she unravels and beholds her own essence: at first she seemeth only to behold herself; but having penetrated farther she discovers the mind. And again, still farther advancing into the innermost sanctuary of the soul, she contemplates the θεῶν γένος. And this, he saith, is the most excellent of all human acts, in the silence and repose of the faculties of the soul to tend upwards to the very Divinity; to approach and be closely joined with that which is ineffable and superior to all beings. When come so high as the first principle, she ends her journey and rests. Such is the doctrine of Proclus.

334. But Socrates in the First Alcibiades[3] teacheth,

[1] The passage here referred to is in *Repub.* Lib. VI. pp. 487 E–489 D, Εἶεν, εἶπον... διεληλύθαμεν, in which the position of the philosopher in the state is likened to that of the able steersman, among a rebellious crew. Berkeley's reason for not quoting it might have been the length of the passage. He could hardly have fancied that it might applied to himself, and the ent under which he lived.

[2] Cap. 3. We have here a rough version of the original; according to which all things are potentially in the soul, which is thus potentially omniscient.

[3] P. 33. The passage in Proclus, quoted in the preceding section, is a commentary on this part of the *First Alcibiades*, where Socrates has it that in knowing the reasonable soul and its ideas we know God, and thus in know-

on the other hand, that the contemplation of God is the proper means to know or understand our own soul. As the eye, saith he, looking steadfastly at the visive part or pupil of another eye, beholds itself, even so the soul beholds and understands herself, while she contemplates the Deity, which is wisdom and virtue, or like thereunto. In the Phædon [1], Socrates speaks of God as being τ' Ἀγαθόν and τὸ Δέον (sect. 260, 322); Plotinus [2] represents God as order; Aristotle [3] as law [4].

335. It may seem, perhaps, to those who have been taught to discourse about substratums, more reasonable and pious, to attribute to the Deity a more substantial being than the notional entities of wisdom, order, law, virtue, or goodness; which being only complex ideas, framed and put together by the understanding, are its own creatures, and have nothing substantial, real, or independent in them. But it must be considered that, in the Platonic system, order, virtue, law, goodness, and wisdom are not creatures of the soul of man, but innate, and originally existent therein, not as an accident in a substance, but as light to enlighten, and as a guide to govern. In Plato's style, the term *idea* doth not merely signify an inert inactive object of the understanding, but is used as synonymous with αἴτιον and ἀρχή, cause and principle [5]. According to that philosopher, goodness, beauty, virtue, and such like are not figments of the mind, nor mere mixed modes, nor yet abstract ideas in the modern sense,

ing God know ourselves. Plato thus maintains the divinity of the reasonable soul. The *First Alcibiades*, Platonic in its tone, is by many regarded as spurious.

[1] *Phædo*, p. 80.

[2] *Sixth Ennead*, Lib. VIII. ad finem; also *Fifth Ennead*, Lib. V. Cf. sect. 328, note 1, with this and the next note.

[3] *De Mundo*, cap. VI. § 36. Not Aristotle.

[4] This is a pregnant sentence. Is not God rightly conceived as, relatively to us, perfect Goodness, Order and Law vivified, and eternally operative? See next section.

[5] Note here the contrast between the sensuous 'ideas' of Berkeley's early writings, and the Divine Ideas of Plato which he now appreciates; by participation in which the relations of things are necessarily determined; and in which, as principles, speculative inquiry seeks its satisfaction. Physical science is the issue of man's tentative endeavours to resolve events in external nature under their rational rules of procedure. But its provisional generalisations, limited by the data of human experience in sense, are far short of the Divine Thought, which constructive Idealism has tried in vain to express fully in the concrete.

but the most real beings, intellectual and unchangeable: and therefore more real than the fleeting, transient objects of sense (sect. 306), which, wanting stability, cannot be subjects of science (sect. 264, 266, 297), much less of intellectual knowledge.

336. By Parmenides, Timæus, and Plato a distinction was made, as hath been observed already, between *genitum* and *ens*. The former sort is always generating or *in fieri* (sect. 304, 306), but never exists; because it never continues the same, being in a constant change, ever perishing and producing. By *entia* they understand things remote from sense, invisible and intellectual, which never changing are still the same, and may therefore be said truly to exist. Οὐσία, which is generally translated substance, but more properly essence, was not thought to belong to things sensible and corporeal, which have no stability; but rather to intellectual ideas, though discerned with more difficulty, and making less impression on a mind stupefied and immersed in animal life, than gross objects that continually beset and solicit our senses.

337. The most refined human intellect, exerted to its utmost reach, can only seize some imperfect glimpses of the Divine Ideas (sect. 313, 330), abstracted from all things corporeal, sensible, and imaginable. Therefore Pythagoras and Plato treated them in a mysterious manner, concealing rather than exposing them to vulgar eyes; so far were they from thinking that those abstract things, although the most real, were the fittest to influence common minds, or become principles of knowledge, not to say duty and virtue, to the generality of mankind.

338. Aristotle[1] and his followers have made a monstrous representation of the Platonic ideas; and some of Plato's own school have said very odd things concerning them. But if that philosopher himself was not read only, but studied also with care, and made his own interpreter, I believe the prejudice that now lies against him would soon wear off (sect. 309, 313), or be even converted into a high esteem for those exalted notions and fine hints that sparkle and shine throughout his writings; which seem to contain

[1] See, for instance, Aristotle's *Metaph.* Lib. I. c. 9, and the interpretation put by Aristotle, in well-known passages, upon the Platonic doctrine of the absoluteness of the Ideas. See also *Metaph.* XII. 4.

not only the most valuable learning of Athens and Greece, but also a treasure of the most remote traditions and early science of the East.

339. In the *Timæus*[1] of Plato mention is made of ancient persons, authors of traditions, and the offspring of the gods. It is very remarkable that, in the account of the creation contained in the same piece, it is said that God was pleased with His work, and that the night is placed before the day. The more we think, the more difficult shall we find it to conceive, how mere man, grown up in the vulgar habits of life, and weighed down by sensuality, should ever be able to arrive at science, without some tradition (sect. 298, 301, 302) or teaching, which might either sow the seeds of knowledge, or call forth and excite those latent seeds that were originally sown in the soul[2].

340. Human souls in this low situation, bordering on mere animal life, bear the weight and see through the dusk of a gross atmosphere, gathered from wrong judgments daily passed, false opinions daily learned, and early habits of an older date than either judgment or opinion. Through such a medium the sharpest eye cannot see clearly (sect. 292, 293, 294). And if by some extraordinary effort the mind should surmount this dusky region, and snatch a glimpse of pure light, she is soon drawn backwards, and depressed by the heaviness of the animal nature to which she is chained. And if again she chanceth, amidst the agitation of wild fancies and strong affections, to spring upwards, a second relapse speedily succeeds into this region of darkness and dreams.

341. Nevertheless, as the mind gathers strength by repeated acts, we should not despond, but continue to exert the prime and flower of our faculties, still recovering, and reaching on, and struggling, into the upper region, whereby our natural weakness and blindness may be in

[1] Pp. 23 and 37. Cf. sect. 298, 301, for illustrations of Berkeley's reverence for ancient philosophy, as a supposed repository of an original Divine Revelation. So Cudworth, and afterwards the Chevalier Ramsay.

[2] Spiritual ideas and principles that are latent in each human mind, make men responsive to their analogues, presented outwardly by tradition or in history. The outward revelation may thus awaken a corresponding inspiration in the individual.

some degree remedied, and a taste attained of truth and intellectual life.—Beside the constant prevailing opinion of the greatest men of antiquity, that there is both an universal Spirit, author of life and motion, and an universal Mind, enlightening and ordering all things, it was a received tenet among them, that there is also τὸ Ἕν or τ' Ἀγαθόν (sect. 322), which they looked on as the *Fons Deitatis*, the first hypostasis in the Divinity.

342. The ONE, or τὸ Ἕν, being immutable and indivisible, always the same and entire, was therefore thought to exist truly and originally, and other things only so far as they are one and the same, by participation of τὸ Ἕν. [1] This gives unity, stability, and reality, to things (sect. 264, 306). Plato describes God, as Moses [2], from His being. According to both, God is He who truly is, ὁ ὄντως ὤν. Change and division were esteemed defects or bad. Evil scatters, divides, destroys. Good, on the contrary, produceth concord and union, assembles, combines, perfects, and preserves entire. The several beings which compose the universe are parts of the same system; they combine to carry on one end, and perfect one whole. And this aptness and concurrence thereunto furnishes the partial particular idea of Good in the distinct creatures. Hence it might have come to pass that τ' Ἀγαθόν and τὸ Ἕν were regarded as one and the same.

343. Light and sight (saith Plato in the sixth book [3] of his Republic) are not the sun: even so truth and knowledge are not the good itself, although they approach

[1] The Platonic and Neo-platonic conception of God is touched in this section; also what finite personality means—a finite Ego in itself, in its relation to God, also to nature, including its own sentient organism. The speculation of the ONE belongs eminently to Parmenides, and to Plotinus and Proclus. In this and the following sections, Berkeley mixes up the opinions of Plato with those of earlier and later philosophers.

[2] *Exodus* III. 14. Some modern critics connect the name Jehovah (Yahwè) with *becoming* rather than with absolute, immutable Being—with development, in short; and orderly development, animated by Spirit. Unity in a necessary Trinity, is Berkeley's implied ultimate conception of τὸ Πᾶν.

[3] This section of *Siris* is a description of what Plato says in the *Republic*; though I do not think he says expressly that the One and the Good are the same, unless this may be inferred from the end of the second book of the *Republic*, and the end of the *Philebus*.

thereunto. And again, what the sun is in a visible place with respect to sight and things seen, that same is τ' ἀγαθόν or Good in an intelligible place, with respect to understanding and things understood. Therefore the Good or One is not the light that enlightens, but the source of that light.

344. Every moment produceth some change in the parts of this visible creation. Something is added, or diminished, or altered, in essence, quantity, quality, or habitude. Wherefore all generated beings were said by the ancients to be in a perpetual flux (sect. 304, 336). And that which, on a confused and general view, seems one single constant Being, shall upon a nearer inspection appear a continued series of different beings. But God remains for ever one and the same. Therefore God alone exists. This was the doctrine of Heraclitus, Plato, and other ancients.

345. It is the opinion of Plato and his followers[1] that in the soul of man, prior and superior to intellect, there is somewhat of a higher nature, by virtue of which we are One; and that by means of our one or unit, we are most closely joined to the Deity. And, as by our intellect we touch the Divine Intellect, even so by *our* τὸ ἕν or unit, the very flower of our essence, as Proclus expresseth it[2], we touch the first One.

346. According to the Platonic philosophy, *ens* and *unum* are the same. And consequently our minds participate so far of existence as they do of unity. But it should seem that Personality is the indivisible centre of the soul or mind; which is a monad so far forth as she is a person. Therefore Person is really that which exists; inasmuch as it participates the Divine Unity. In man the monad or indivisible is the αὐτὸ τὸ αὐτό, the self-same self, or very self; a thing in the opinion of Socrates, much and narrowly to be inquired into and discussed, to the end

[1] In this and the preceding section there is more than is found in Plato. Proclus, *In Theol. Plat.*, Lib. II. cap. 4-12, expounds and defends Plato's doctrine of the ONE, referring especially to passages in the *Parmenides*, *Republic*, *Philebus*, and *Sophista*. These chapters may have been in Berkeley's view, in this and the three foregoing sections.

[2] *In Theol. Plat.*, Lib. III. c. 4. In the first part of this book, Proclus speculates on the manner in which human souls participate in the One.

that, knowing ourselves, we may know what belongs to ourselves and to our happiness.

347. Upon mature reflexion, the person or mind of all created beings seemeth alone indivisible, and to partake most of unity[1]. But sensible things are rather considered as one than truly so, they being in a perpetual flux or succession, ever differing and various. Nevertheless, all things together may be considered as one universe (sect. 287, 288); one by the connexion, relation, and order of its parts, which is the work of mind, whose unit is, by Platonics, supposed a participation of the first τὸ Ἕν.

348. Socrates, in the *Theætetus* of Plato, speaketh of two parties of philosophers—the ῥέοντες, and οἱ τοῦ ὅλου στασιῶται: the flowing philosophers, who held all things to be in a perpetual flux, always generating and never existing; and those others who maintained the universe to be fixed and immovable[2]. The difference seems to have been this, that Heraclitus, Protagoras, Empedocles, and in general those of the former sect, considered things sensible and natural; whereas Parmenides and his party considered τὸ πᾶν, not as the sensible but as the intelligible world (sect. 293, 294, 295), abstracted from all sensible things.

349. In effect, if we mean by *things* the *sensible* objects, these, it is evident, are always flowing; but if we mean things purely *intelligible*, then we may say on the other hand, with equal truth, that they are immovable and unchangeable. So that those who thought the Whole, or τὸ Πᾶν, to be Ἕν ἑστώς, a fixed or permanent One, seem to have understood the Whole of real beings; which in their sense was only the intellectual world, not allowing reality of being to things not permanent[3].

350. The displeasure of some readers may perhaps be incurred, by surprising them into certain reflexions and inquiries for which they have no curiosity. But perhaps

[1] Our own continued personality and personal identity, revealed in memory, is, with Berkeley, our concrete type of all *sameness* and *unity*—that from which we originally derive the meaning of those terms.

[2] P. 181. On the 'flowing philosophers,' see Cudworth's *Eternal and Immutable Morality*, pp. 242, &c.

[3] Compare this with the conception of 'reality' in the *Principles*.

some others may be pleased to find a dry subject varied by digressions, traced through remote inferences, and carried into ancient times, whose hoary maxims (sect. 298, 301), scattered in this Essay, are not proposed as principles, but barely as hints to awaken and exercise the inquisitive reader, on points not beneath the attention of the ablest men. Those great men, Pythagoras, Plato, and Aristotle, the most consummate in politics, who founded states, or instructed princes, or wrote most accurately on public government, were at the same time most acute at all abstracted and sublime speculations; the clearest light being ever necessary to guide the most important actions. And, whatever the world thinks, he who hath not much meditated upon God, the human mind, and the *summum bonum*, may possibly make a thriving earthworm, but will most indubitably make a sorry patriot and a sorry statesman.

351. According to the nice metaphysics of those ancient philosophers, τὸ Ἕν[1], being considered as what was first and simplest in the Deity, was prescinded even from entity, to which it was thought prior and superior; and is therefore by the Platonics styled super-essential. And in the Parmenides it is said, τὸ Ἕν doth not exist[2]; which might seem to imply a negation of the Divine Being. The truth is, Zeno and Parmenides argued that a thing existing in time was older and younger than itself; therefore the constant immutable τὸ Ἕν did not exist in time: and if not in time, then in none of the differences of time past, present, or to come; therefore we cannot say that it was, is, or will be. But, nevertheless, it is admitted, in the same Parmenides, that τὸ νῦν is everywhere present to

[1] The contemplation of τὸ Ἕν, or that ineffable Hypostasis which is 'first and simplest' in Deity, suggests further speculation on Divine Being, as involving also Intellect and Life. This introduces the ultimate Trinity, after which *Siris* concludes, in sections of exquisite beauty. Cf. Cudworth's *Intellectual System*, Bk. IV. c. 36. That Plato taught a Trinity of Hypostases is now generally disallowed, and has long been, even in England. See Cæsar Morgan's *Investigation of the Trinity of Plato and of Philo-Judæus* (1795).

[2] This is one of the assumptions of Parmenides, when he unfolds his conception of the One. The dialogue appears to be a sort of dialectical entertainment, not containing the real views of Parmenides or of Plato.

τὸ Ἕν; that is, instead of a temporary succession of moments, there is one eternal Now, or *punctum stans*, as it is termed by the schoolmen.

352. The simplicity of τὸ Ἕν (the Father in the Pythagoric and Platonic Trinity) is conceived such as to exclude intellect or mind, to which it is supposed prior; and that hath created a suspicion of Atheism in this opinion: for, saith the learned Doctor Cudworth [1], shall we say that the first Hypostasis or Person is ἄνους and ἄλογος, senseless and irrational, and altogether devoid of mind and understanding? or would not this be to introduce a kind of mysterious Atheism? To which it may be answered, that whoever acknowledgeth the universe to be made and governed by an Eternal Mind cannot be justly deemed an Atheist (sect. 154, 276, 279, 287). And this was the tenet of those ancient philosophers. In the Platonic doctrine, the generation of the Νοῦς or Λόγος was not contingent but necessary; not temporary but from everlasting. There never was a time supposed wherein τὸ Ἕν subsisted without Intellect; the priority having been understood only as a priority of order or conception, but not a priority of age. Therefore, the maintaining a distinction of priority between τὸ Ἕν and Νοῦς doth not infer that the one ever existed without the other. It follows, therefore, that the Father, or τὸ Ἕν, may, in a certain sense, be said to be ἄνους without Atheism, or without destroying the notion of a Deity; any more than it would destroy the notion of a human soul, if we should conceive a distinction between self and intellect, or intellect and life [2]. To which we may

[1] 'Shall we say that the First Hypostasis or Person in the Platonic Trinity (if not the Christian also) is ἄνους or ἄλογος, senseless and irrational, and altogether devoid of mind or understanding? Or would not this be to introduce a certain kind of mysterious Atheism, and under pretence of magnifying and advancing the Supreme Deity, monstrously to degrade the same? For why might not senseless Matter be supposed to be the first original of all things, as well as a *senseless* incorporeal Being?' (Cudworth, *Intellectual System*, Bk. IV. ch. 36. p. 585, ed. 1678.) Cf. *Alciphron*, Dial. IV. sect. 17, 18; also the references to Archbishop King, Bishop Browne, and the writings attributed to the Areopagite Dionysius, on the amount of theological knowledge that is possible in a human intelligence.

[2] The so-called triune 'faculties' of the human soul are manifested in their distinguishable mental products. The analogy is applied to the triune manifestation of Deity, according to Plato and Plo-

farther add, that it is a doctrine of Platonics, and agrees with their master's tenets, to say that τὸ Ἕν, or the first Hypostasis, contains all Excellence and Perfection, whereof it is the original source, and is *eminenter*, as the schools speak, intellect and life, as well as goodness; while the second Hypostasis is essentially Intellect, and, by participation, goodness, and life; and the third, Life essentially, and, by participation, goodness, and intellect.

353. Therefore, the whole being considered, it will not seem just to fix the imputation of Atheism upon those philosophers who held the doctrine of τὸ Ἕν (sect. 287, 288); whether it be taken in an abstracted or collective, a metaphysical or merely vulgar meaning (sect. 300): that is, whether we prescind Unity from essence and intellect; since metaphysical distinctions of the divine attributes do not in reality divide them: or whether we consider the universal system of beings as One; since the union, connexion, and order of its members do manifestly infer a mind or intellect to be cause thereof.

354. The One, or τὸ Ἕν, may be conceived either by composition or division. For as, on the one hand, we may say the world or universe is One Whole, or One Animal; so we may, on the other hand, consider τὸ Ἕν by division or abstraction, as somewhat in the order of things prior to mind. In either sense there is no atheism, so long as mind is admitted to preside and direct the Animal; and so long as the *Unum*, or τὸ Ἕν, is supposed not to exist without mind (sect. 287, 288). So that neither Heraclitus, nor Parmenides, nor Pythagoras, nor Plato; neither the Egyptians, nor Stoics, with their doctrine of a Divine Whole or Animal; nor Xenophanes with his ἓν καὶ πᾶν, are justly to be accounted Atheists. Therefore, modern Atheism[1], be it of Hobbes, Spinosa, Collins[2], or whom you will, is not to be countenanced by the learning and great names of antiquity.

355. Plato teacheth[3] that the doctrine concerning the

tinus. So also Hegel, with whom the universal, the particular, and the singular correspond to Intellect, Feeling, and Will—the trinity of human consciousness.

[1] Atheism abstracts the universe from Omnipotent Goodness realised in living Mind.

[2] Collins, so often criticised by implication in *Alciphron* and elsewhere, is here named. He died fifteen years before *Siris* appeared.

[3] *Republic*, pp. 256, 257.

One or Unit is a means to lead and raise the mind to the knowledge of Him who truly is (sect. 294, 295). And it is a tenet both of Aristotle and Plato, that identity is a certain unity. The Pythagoreans also, as well as the Platonic philosophers, held *unum* and *ens* to be the same. Consistently with which, that only can be said to exist which is one and the same. In things sensible and imaginable, as such, there seems to be no unity, nothing that can be called one, prior to all act of the mind; since they, being in themselves aggregates, consisting of parts or compounded of elements, are in effect many. Accordingly, it is remarked by Themistius[1], the learned interpreter of Aristotle, that to collect many notions into one, and to consider them as one, is the work of intellect, and not of sense or fancy.

356. Aristotle himself, in his third book of the Soul[2], saith it is the mind that maketh each thing to be one, τὸ δὲ ἓν ποιοῦν, τοῦτο ὁ νοῦς ἕκαστον. How this is done, Themistius is more particular, observing that, as being conferreth essence, the mind, by virtue of her simplicity, conferreth simplicity upon compounded beings. And, indeed, it seemeth that the mind, so far forth as person, is individual (sect. 345, 346, 347); therein resembling the Divine One by participation, and imparting to other things what itself participates from above. This is agreeable to the doctrine of the ancients; however the contrary opinion of supposing *number* to be an original primary quality in things, independent of the mind, may obtain among the moderns[3].

357. The Peripatetics taught that in all divisible things there was somewhat indivisible, and in all compounded things somewhat simple. This they derived from an act of the mind. And neither this simple indivisible unit, nor any sum of repeated units, consequently no number, can be separated from the things themselves, and from the operation of the mind. Themistius goeth so far as to affirm that it cannot be separated from the words or signs; and, as it cannot be uttered without them, so, saith he, neither can it be conceived without them. Thus much

[1] In his Commentary on the *De Anima*, Lib. III.

[2] C. 6, where Aristotle teaches how error becomes possible. Cf. the commentary of Themistius.

[3] As with the Cartesians and Locke.

upon the whole may be concluded, that, distinct from the mind and her operations, there is in created beings neither unit nor number[1].

358. Of inferior beings the human mind, self, or person, is the most simple and undivided essence (sect. 347). And the Supreme Father is the most perfect One. Therefore the flight of the mind towards God is called by the Platonics φυγὴ μόνου πρὸς μόνον. The Supreme Being, saith Plotinus[2], as he excludes all diversity, is ever alike present. And we are then present to Him, when, recollected and abstracted from the world and sensible objects, we are most free and disengaged from all variety (sect. 268). He adds that in the intuition of the Supreme Deity the soul finds her wished-for end and repose; which that philosopher calls awaking out of his body into himself.

359. In the tenth book of the *Arcane*, or *Divine Wisdom of the Egyptians*[3], we are taught that the Supreme Being is not the cause of any created thing; but that he produced or made the Word; and that all created beings were made by the Word; which is accordingly styled the Cause of all causes: and that this was also the doctrine of the Chaldeans. Plato, likewise, in his Letter[4] to Hermias, Erastus, and Coriscus, speaks of God, the ruler and cause of all things, as having a Father: and, in his *Epinomis*[5], he expressly teacheth that the Word or Λόγος made the world. Accordingly, Saint Augustine, in his Commentary on the beginning of Saint John's Gospel, having declared that Christ is the Wisdom of God by which all things were made, observes that this doctrine was also found in the writings of philosophers, who taught that God had an only begotten Son, by whom are all things.

360. Now, though Plato had joined with an imagination the most splendid and magnificent, an intellect not less deep and clear; yet it is not to be supposed that either he or any other philosophers of Greece or the East had

[1] Cf. *New Theory of Vision*, sect. 109, also *Principles*, sect. 12, 13, with this and the two preceding sections—the earlier with the latest expression of his thought on this subject.

[2] *Fifth Ennead*, Bk. V. c. 9.

[3] Cf. sect. 288.

[4] Epist. VI. p. 323 — not now assigned to Plato.

[5] P. 978. The *Epinomis* is not regarded as genuine.

by the light of nature obtained an adequate notion of the holy Trinity; nor even that their imperfect notion, so far as it went, was exactly just; nor perhaps that those sublime hints, which dart forth like flashes of light in the midst of a profound darkness, were originally struck from the hard rock of human reason; but rather derived, at least in part, by a Divine tradition, from the Author of all things (sect. 298, 301). It seems a remarkable confirmation of this, what Plotinus observed in his fifth Ennead[1], that this doctrine of a Trinity—Father, Mind, and Soul—was no late invention, but an ancient tenet.

361. Certain it is that the notion of a Trinity is to be found in the writings of many old heathen philosophers; that is to say, a notion of Three Divine Hypostases. Authority, Light, and Life did, to the eye of reason, plainly appear to support, pervade, and animate the mundane system or Macrocosm. The same appeared in the microcosm[2], preserving soul and body, enlightening the mind, and moving the affections. And these were conceived to be necessary universal principles; co-existing and co-operating, in such sort as never to exist asunder, but on the contrary to constitute One Sovereign of all things. And, indeed, how could power or authority avail or subsist without knowledge? or either without life and action?

362. In the administration of all things, there is Authority to establish, Law to direct, and Justice to execute. There is first the source of all perfection, or *Fons Deitatis*; secondly, the supreme Reason, order, or λόγος; and lastly, the Spirit which quickens and inspires. We are sprung from the Father, irradiated or enlightened by the Son, and moved by the Spirit. Certainly, that there is Father, Son, and Spirit; that these bear analogy to the sun, light,

[1] *Fifth Ennead*, Bk. I. c. 5. Ficinus, in his Commentary, here says:—'Pythagorici fingunt, in quadam quasi processione ipsius Unius, oriri Binarium, in quodam Binarii termino Ternarium suboriri, similiterque deinceps: Platonici similiter de prima essentia judicant.'

[2] Human consciousness is in a manner *triune*—involving the elements of Sensibility, Intellect, and Will. These three are in different proportions in different persons, but they coexist and co-operate in all. Intellect in man also involves a sort of *triunity*—Sense, Ideation, and Reason, discursive and intuitive.

and heat; and are otherwise expressed by the terms Principle, Mind, and Soul; by One or τὸ Ἕν, Intellect, and Life; by Good, Word, and Love; and that generation was not attributed to the second Hypostasis, the Νοῦς or Λόγος, in respect of time (sect. 352), but only in respect of origin and order, as an eternal necessary emanation;—these are the express tenets of Platonists, Pythagoreans, Egyptians, and Chaldeans.

363. Though it may be well presumed there is nothing to be found on that sublime subject in human writings which doth not bear the sure signatures of humanity; yet it cannot be denied that several Fathers of the Church have thought fit to illustrate the Christian doctrine of the holy Trinity, by similitudes and expressions borrowed from the most eminent heathens, whom they conceived to have been no strangers to that mystery; as hath been plainly proved by Bessarion[1], Eugubinus[2], and Doctor Cudworth[3].

364. Therefore, how unphilosophical soever that doctrine may seem to many of the present age, yet it is certain that men of greatest fame and learning among the ancient philosophers held a Trinity in the Godhead. It must be owned, that upon this point some later Platonists of the Gentile world seem to have bewildered themselves (as many Christians have also done), while they pursued the hints derived from their predecessors with too much curiosity.

365. But Plato himself considered that doctrine as a venerable mystery, not to be lightly treated of, or rashly divulged. Wherefore in a Letter to Dionysius[4], he writes

[1] Cardinal Bessarion (1395–1470), the learned Platonist. See his *Adversus Calumniatorem Platonis*, Lib. II. c. 3.

[2] In the treatise *De Perenni Philosophia* (1540), Lib. II. c. 7–18, of Augustinus Steuchus, Eugubinus (i. e. of Iguvium, now Gubbio, in Central Italy). He was born in the end of the fifteenth century, and died in 1550. This Cretan bishop and Platonising divine gathered into the treatise referred to a medley of illustrations of the harmony of Eastern and Greek philosophy with Christianity, as to the Divine Trinity in Unity, creation, and the immortality of souls. Berkeley seems to have studied the *De Perenni Philosophia*, a curious and little-known book.

[3] See *Intellectual System*, Bk. IV. c. 36.

[4] Epist. II. p. 312—not Plato's. See the comment on this passage, in the second book of Proclus on the Theology of Plato, quoted in Taylor's Plato.

(as he himself professeth) enigmatically and briefly in the following terms, which he giveth for a summary of his notion concerning the Supreme Being, and which, being capable of divers senses, I leave to be deciphered by the learned reader:—Περὶ τὸν πάντων βασιλέα πάντ' ἐστί, καὶ ἐκείνου ἕνεκα πάντα, καὶ ἐκεῖνο αἴτιον ἁπάντων τῶν καλῶν. δεύτερον δέ, περὶ τὰ δεύτερα, καὶ τρίτον περὶ τὰ τρίτα. Plato enjoins Dionysius, over and over, with great earnestness, not to suffer what he communicates concerning the mysteries of the Divine nature to fall into illiterate or vulgar hands, giving it withal as a reason for this caution, that nothing would seem more ridiculous or absurd to the common run of mankind. He adds that, in regard writings might miscarry, the prudent way was to write nothing at all on those matters, but to teach and learn them by word of mouth: for which reason, saith he, I have never wrote anything thereon; nor is there, nor shall there ever be, anything of Plato's extant on the subject. He farther adds, as for what hath been now said, it belongs all to Socrates.

366. And, indeed, what this philosopher in his *Phædrus*[1] speaketh of the super-celestial region, and the Divinity resident therein, is of a strain not to be relished or comprehended by vulgar minds; to wit, Essence, really existent, object of intellect alone, without colour, without figure, without any tangible quality. He might very justly conceive that such a description must seem ridiculous to sensual men.

367. As for the perfect intuition of divine things, that he supposeth to be the lot of pure souls, beholding by a pure light, initiated, happy, free and unstained from those bodies, wherein we are now imprisoned like oysters. But, in this mortal state, we must be satisfied to make the best of those glimpses within our reach (sect. 335, 337). It is Plato's remark, in his *Theætetus*[2], that while we sit still we are never the wiser; but going into the river, and moving up and down, is the way to discover its depths and shallows. If we exercise and bestir ourselves, we may even here discover something.

368. The eye by long use comes to see even in the

[1] Pp. 246–258. Cf. *Symposium*, p. 211. [2] P. 200.

darkest cavern: and there is no subject so obscure but we may discern some glimpse of truth by long poring on it. Truth is the cry of all, but the game of a few. Certainly, where it is the chief passion, it doth not give way to vulgar cares and views; nor is it contented with a little ardour in the early time of life; active, perhaps, to pursue, but not so fit to weigh and revise. He that would make a real progress in knowledge must dedicate his age as well as youth, the later growth as well as first fruits, at the altar of Truth.

Cujusvis est errare; nullius nisi insipientis in errore perseverare.
Cic. [*Orat. Philip.* XII. 2.]