



KEY TEXTS: CLASSICAL

edited by
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ANGLOPHONE PHILOSOPHY

UTZ

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Key Texts: Classical Anglophone Philosophy

Philosophie
Band 33

Ebook (PDF)-Ausgabe:
ISBN 978-3-8316-7287-5 Version: 1 vom 28.02.2017
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Alternative Ausgabe: Softcover
ISBN 978-3-8316-4431-5
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Collection prepared in Ethikzentrum Jena by

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Philosophie · Band 33

Satz und Layout: Matthias Hoffmann

Umschlaggestaltung: Matthias Hoffmann unter Verwendung der Abbildung „Big Ben“
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Bibliografische Information der Deutschen Nationalbibliothek: Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.d-nb.de> abrufbar.

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ISBN 978 3 8316 4431 5

Printed in EU

Herbert Utz Verlag GmbH, München

089-277791-00 · www.utzverlag.de

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Introduction to Key Texts: Classic Anglophone Philosophy

The texts of this collection were all written in the English language. Much more unites the authors of the texts, of course, but most importantly they all share that common language and the history associated with the island of Great Britain – whether they were subjects of its crown or not. That history is both distinctly European and distinct from the European continent even in the branches that developed apart from the British island, most notably in America. The 16th-century English Reformation and World War I bracket the time frame adopted for the present collection (with the qualification that Dewey's selection reflects his earlier developments). This was a time when British political power extended around the globe – upon which the sun never set. The argument could be made that the ideas that emerged during this time had an even wider reach and impact.

What is distinct about the Anglophone philosophical tradition?

The English Reformation not only created a break with the religious and political claims of the European continent upon Great Britain, it reinforced a British identity and way of thinking that was consciously and confidently independent. King Henry VIII's break with Rome was not primarily theological or even radical, but political and initially motivated by his desire to remarry without any intervention from the pope. With regard to the impact on philosophy, scholasticism was the most obvious and immediate casualty, and writers like Bacon and Hobbes take extra pains to point out the method's flaws. Subsequent writers do not even consider it. Even the title "English Reformation" is an anachronism, as the period it represents began from political motives by a Catholic king fully invested in a monarchical and thus hierarchical system. Nevertheless, the Reformation had a secularizing and democratizing impact on society as experienced in religion, government, as well as the universities that prepared students for administering both church and state as those institutions became increas-

ingly distinct. Except for Berkeley, none of the authors included here had religious appointments. And while the monarchy maintained at least some role in the United Kingdom, Parliament and democratic impulses enjoyed ever-greater legitimacy in social and political arguments. Understanding contemporary secular democracy is impossible without understanding this tradition.

Anglophone philosophy possesses three distinctive elements with respect to 1. Society, 2. Violence, and 3. Reason.

1. Society: Edmund Burke most famously describes the British devotion to order preserved in customs, and this is a characteristic of all the authors included in this collection, even the later ones associated with pragmatism. Society is bound together by centuries of customs embodied in law and yet continuously pressured by the streams and variations of competing interests. Even King Henry VIII had worked together with Parliament to sustain centuries-old privileges as he innovatively reinterpreted them to establish his distance from Roman claims. Ideas of society as tradition-bound infuse and are reflected in the common law systems and sensibilities that inform all Anglophone philosophy.

This provides a tension for Locke looking to find stability during civil and political unrest, but Locke remains committed to understanding society from the perspective of a careful observer, and never steps into a role of social construction. Like Locke, the authors strive to find the deeper ties that bind society when the superficial or faulty connections are torn. The US writers find these connections in the natural rights when they can no longer reasonably consider themselves “Englishmen”.

Charles Taylor reminds us of the tameness of social contract theories such as Locke’s: “The grounding of political legitimacy in consent is not put forward in order to question the credentials of exiting governments. The aim of the exercise is rather to undercut the reasons for rebellion being all too irresponsibly urged by confessional zealots; the assumption being that existing legitimate regimes were ultimately founded on some consent of this kind.” (Charles Taylor, *A Secular Age*, 2007: 159–160) What the new (post-Reformation) natural law arguments of Hobbes and Locke demonstrate is the central role of individuals as the reference point for social and political legitimation.

2. Violence: Violence is an element of the natural world that is controlled and even harnessed by a well-ordered society – and

thus violence itself is neither evil nor avoidable, any more than the oceans' tides. The role of the philosopher is to understand the tides of violence within, threatening, and sustaining social structures. On the individual level, humans fulfill social responsibilities and abide by laws because, among other reasons, non-conforming actors expose themselves to a threat of violence. On a social and inter-group level, outright war is merely a manifestation of existing violence – which otherwise exists in various forms of formal and informal agreements embodied in treaties, agreements, political relationships and class-status structures. The philosopher's awareness of violence is an aspect of a form of "materialism" that is relevant to even more metaphysical philosophical writings of Bacon and Berkeley. This materialism is quite distinct to the continental historical materialism found in Hegel and Marx. Anglophone materialism is recognizable in the clear-eyed non-nonsense practicalness of Hobbes as well as the rational skepticism of Hume. Smith seeks to train the force of violence in useful industry and Burke fears its release in systems underappreciating its potential terribleness. Wollstonecraft sees the impact of violence in systems that degrade women. And both white and black Americans seek systems of balancing access and thus threats of violence.

The postmoderns like Foucault who trained their eyes on unseen power embedded in structures of rationality had good teachers in Wollstonecraft, Douglass, and Du Bois – a woman and two black American men. All three acutely experienced the violence of the philosophical ideas that shaped and defended social and political systems that perpetuated inequalities among men and women, as well as slavery and degradation of persons with African ancestry. The works of Wollstonecraft, Douglass, and Du Bois are valuable in themselves, and they also offer evidence of contemporaneous Anglo-American critics fully conscious of the contradictions of political ideals of freedom and equality. The inclusion of these authors is intended to recognize and in some small way correct the violence that even a collection can perpetuate in the exclusion of historically marginalized voices.

3. Reason: The Anglophone tradition is somewhat materialistic and secular, and decidedly non-idealistic. It is rigorously based on empirically substantiated evidence. It is consequentialist in the sense that it is pragmatically ordered to demonstrable results. These authors were able to read Latin and to read, speak and write in French, with the exception of the post-revolution Americans. Nevertheless, all chose to not only write in English, but to be particularly vernacular about it. We have re-

vised the more archaic English somewhat, but hopefully not too much. These texts were written for wider audiences than the university, and they possess a flair of language and a fullness of ripe examples and analogies to convey deep ideas and plain good sense. Our aim in editing them was to make their pragmatic rationality as accessible to an audience reading these texts from non-English-speaking backgrounds.

The utilitarians Bentham and Mill bring the Anglophone tradition in a direction that continues the practical focus even while their rational grounds for such action border on the abstract, namely a notion of value based upon a rational calculus of pleasure. The abstraction together with the stoic acceptance of violence was used to allay temptations for British subjects to feel compassion for the vast misery of the people affected by British colonial policies. The Irish Famines of 1846–48 were interpreted as necessary reductions in population that would only get worse if charity were to prevent the “natural” expiration of surplus populations. Moore and Russell represent the tradition’s continuing “analytic” turn to mathematical precision applied more generally and even metaphysically. This expression of the tradition is not quite consistent with the practical hypothesis posed above, but that hypothesis is given support by the final three pragma-

tist philosophers Peirce, James, and Dewey.

This selection of texts from a single tradition should also reveal the application of reason to successively wider groups of people. The ideas may have emerged from a male aristocratic society, but successive philosophers found resources within the tradition to analyze the tradition. Locke, Burke, the US Founders, Wollstonecraft, Douglass, Lincoln, and Du Bois are fiercely critical of the irrational conclusions that their immediate generations had considered tolerable. This is not just a cause for historical wonder, but is rather as Anthony Appiah argues presently, a cause for us to question ourselves — what are our present biases that afflict us today and will be condemned by future generations? Perhaps indifference to refugees, human suffering due to non-democratic theocracies, economic inequality, climate changes, human cruelty to animals ... the list is long. So careful reading of these texts requires that we look upon writers from other “rational worlds” and in doing so, we allow these clever folks to also look back at our world with brilliant and challenging eyes.

A word on the texts themselves. We collected these classic texts from a great pool of potential texts to provide a kind of introduction into a tradition. We are fully aware of the ready availability of online re-

sources and we in no way hope to replace that. Rather, we offer these texts that already exist in the public domain as a useful introduction and as an entry to online resources. Further, because we have amended these texts to make them as readable as possible, we have rendered them unfit for citing in scientific or academic scholarship. We therefore advise the reader to see this collection as pointing the way to libraries and online resources where the full and intact sources are to be found. In fact, we recommend the following online websites as useful and trustworthy places:

Fordham University's "Internet History Sourcebooks Project" edited by Paul Halsall

<http://legacy.fordham.edu/Halsall/index.asp>

Stanford Encyclopedia of Philosophy

<http://plato.stanford.edu>

We offer our thanks to the help of our colleagues at the Chair of Applied Ethics at The Friedrich Schiller University of Jena, Germany, especially Stephanie Clarke who revised the texts, making them more understandable to our readers.

September, 2016, Jena, Germany

1 Francis Bacon (1561–1626)

Introduction

Francis Bacon's philosophy marks a critical historical turning point from ancient and renaissance thinking to what he considered a new era dedicated to principles of empirically-based scientific methods. Bacon is as much publicizer as philosopher in his rejection of traditional scholastic modes of thought that integrated religious faith with all other forms of reasoning. Renaissance philosophy did not appeal to Bacon either; he considered it more poetry than knowledge based on experience. What was needed, he argued, was a radical break from the past in a revolutionary new age of reason.

A new kind of philosophical method was needed, one free from the binds and obscurantism of religion, aesthetics, and sophistic modes of argumentation. In addition to method, philosophy needed a clear purpose. It should serve the material welfare of society. Bacon was not the first philosopher to advocate improvement of people's living conditions, but he stands out in prioritizing this obligation for philosophy. Bacon separated himself from the tradition before him by rejecting pure theory

as an ideal for its own sake – the applicability of knowledge was crucial. Mastery of nature became the primary focus of his thought. Insights into the laws governing the processes of nature should allow their prediction and, even more important, their utilization and manipulation. In this sense, he pioneered empiricism and modern scientific methods, especially inductive methodologies.

Bacon lived during the fascinating early decades of English Reformation. It was a time of not only religious, but also political, social and legal transformation. With his prodigious intellectual and social gifts, his legal training and his family's political standing, he was an actor and not just a witness in this time of transformation. He attended Cambridge's Trinity College and, to his mind, suffered its scholastic curriculum. That experience convinced him that the current philosophy was erroneous in both method and objective. He followed then to Grey's Inn where he prepared for a legal and political career. His father Sir Nicholas Bacon had served as Lord Keeper of the Great Seal, the highest

law office in the English kingdom. Francis Bacon would follow his father in serving the crown. The sudden death of his father forced Francis Bacon to start his own political career. He became member of the parliament, later Attorney General – the chief legal advisor of the crown – and Lord Chancellor. In his official capacities, he tried to put forward ideas of rational governance of political and social developments, and tried to launch a science policy that would result in a coordinated organization of science. With one foot in the modern era, Francis Bacon nevertheless remains a transition figure. Some traditional metaphysical premises remain especially in Bacon's epistemology: the Aristotelean idea, for example, that there are forms of reality which are

captured by cognition. And judged by the measures of modern philosophy, Bacon's thought seems unsystematic, aphoristic and conceptually imprecise. But it is unfair to judge his thought by the yardstick of later modern philosophy. In his ambition to herald a revolutionary intellectual modernity, he did not presume to be the one to build that comprehensive philosophical system. Bacon's writing should be read in the context of practical objectives – they are interwoven with political efforts to build a public structure of scientific research. The following excerpts from Bacon's *Novum Organum* (New Method) show the mentioned motives of his thought, its modern dimensions as well as its traditional residues.

Novum Organum (1620)

Book One

I

Man, being the servant and interpreter of Nature, can do and understand so much and so much only as he has observed in [...]

fact or in thought of the course of nature. Beyond this he neither knows anything nor can do anything.

III

Human knowledge and human power meet in one; for where the cause is not known the effect cannot be produced. Nature to be commanded must be obeyed;

and that which in contemplation is as the cause is in operation as the rule.

[...]

XIX

There are and can be only two ways of searching into and discovering truth. The one flies from the senses and particulars to the most general axioms, and from these principles, the truth of which it takes for settled and immovable, proceeds to judgment and to the discovery of middle axi-

oms. And this way is now in fashion. The other derives axioms from the senses and particulars, rising by a gradual and unbroken ascent, so that it arrives at the most general axioms last of all. This is the true way, but as yet untried.

XX

The understanding left to itself takes the same course (namely, the former) which it takes in accordance with logical order. For the mind longs to spring up to positions of higher generality, that it may find rest

there, and so after a little while wearies of experiment. But this evil is increased by logic, because of the order and solemnity of its disputations.

[...]

XXII

Both ways set out from the senses and particulars, and rest in the highest generalities; but the difference between them is infinite. For the one just glances at experi-

ment and particulars in passing, the other dwells duly and orderly among them.

[...]

XXXVII

The doctrine of those who have denied that certainty could be attained at all has some agreement with my way of proceeding at the first setting out; but they end in being infinitely separated and opposed. For the holders of that doctrine assert simply that nothing can be known. I also as-

sert that not much can be known in nature by the way which is now in use. But then they go on to destroy the authority of the senses and understanding; whereas I proceed to devise and supply helps for the same.

XXXVIII

The idols and false notions which are now in possession of the human understanding, and have taken deep root therein, not only so beset men's minds that truth can hardly find entrance, but even after en-

trance is obtained, they will again in the very instauration of the sciences meet and trouble us, unless men being forewarned of the danger fortify themselves as far as may be against their assaults.

XXXIX

There are four classes of Idols which beset men's minds. To these for distinction's sake I have assigned names, calling the first class Idols of the Tribe; the second, Idols

of the Cave; the third, Idols of the Market Place; the fourth, Idols of the Theater. [...]

XLI

The Idols of the Tribe have their foundation in human nature itself, and in the tribe or race of men. For it is a false assertion that the sense of man is the measure of things. On the contrary, all percep-

tions as well of the sense as of the mind are according to the measure of the individual and not according to the measure of the universe. And the human understanding is like a false mirror, which, receiving

rays irregularly, distorts and discolours the

nature of things by mingling its own nature with it.

XLII

The Idols of the Cave are the idols of the individual man. For everyone (besides the errors common to human nature in general) has a cave or den of his own, which refracts and discolours the light of nature, owing either to his own proper and peculiar nature; or to his education and conversation with others; or to the reading of books, and the authority of those whom he esteems and admires; or to the differences of impressions, accordingly as they

take place in a mind preoccupied and pre-disposed or in a mind indifferent and settled; or the like. So that the spirit of man (according as it is meted out to different individuals) is in fact a thing variable and full of perturbation, and governed as it were by chance. Whence it was well observed by Heraclitus that men look for sciences in their own lesser worlds, and not in the greater or common world.

XLIII

There are also Idols formed by the intercourse and association of men with each other, which I call Idols of the Market Place, on account of the commerce and consort of men there. For it is by discourse that men associate, and words are imposed according to the apprehension of the vulgar. And therefore the ill and unfit choice of words wonderfully obstructs the understanding. Nor do the definitions or explanations wherewith in some things learned men are wont to guard and defend themselves, by any means set the matter right. But words plainly force and overrule the

understanding, and throw all into confusion, and lead men away into numberless empty controversies and idle fancies.

XLIV

Lastly, there are Idols which have immigrated into men's minds from the various dogmas of philosophies, and also from wrong laws of demonstration. These I call Idols of the Theater, because in my judgment all the received systems are but so many stage plays, representing worlds of their own creation after an unreal and scenic fashion. Nor is it only of the systems now in vogue, or only of the ancient sects and philosophies, that I speak; for many more plays of the same kind may yet be composed and in like artificial manner set

forth; seeing that errors the most widely different have nevertheless causes for the most part alike. Neither again do I mean this only of entire systems, but also of many principles and axioms in science, which by tradition, credulity, and negligence have come to be received.

But of these several kinds of Idols I must speak more largely and exactly, that the understanding may be duly cautioned.

[...]

LXVIII

So much concerning the several classes of Idols and their equipage; all of which must be renounced and put away with a fixed and solemn determination, and the understanding thoroughly freed and cleansed; the entrance into the kingdom of man,

founded on the sciences, being not much other than the entrance into the kingdom of heaven, where into none may enter except as a little child.

[...]

LXXIV

Signs also are to be drawn from the increase and progress of systems and sciences. For what is founded on nature grows and increases, while what is founded on opinion varies but increases not. If therefore those doctrines had not plainly been

like a plant torn up from its roots, but had remained attached to the womb of nature and continued to draw nourishment from her, that could never have come to pass which we have seen now for twice a thousand years; namely, that the sciences

stand where they did and remain almost in the same condition, receiving no noticeable increase, but on the contrary, thriving most under their first founder, and then declining. Whereas in the mechanical arts, which are founded on nature and the light of experience, we see the contrary

happen, for these (as long as they are popular) are continually thriving and growing, as having in them a breath of life, at the first rude, then convenient, afterwards adorned, and at all times advancing.

[...]

LXXXI

Again there is another great and powerful cause why the sciences have made but little progress, which is this. It is not possible to run a course aright when the goal itself has not been rightly placed. Now the true and lawful goal of the sciences is none other than this: that human life be endowed with new discoveries and powers. But of this the great majority have no feeling, but are merely hireling and professorial; except when it occasionally happens that some workman of acuter wit and covetous of honor applies himself to a new invention, which he mostly does at the expense of his fortunes. But in general, so far are men from proposing to themselves to augment the mass of arts and sciences, that from the mass already at hand they neither take nor look for anything more than what they may turn to use in their lectures, or to gain, or to reputation, or to some similar advantage. And if any one out of all the multitude court science with honest affection and for her own sake, yet even with

him the object will be found to be rather the variety of contemplations and doctrines than the severe and rigid search after truth. And if by chance there be one who seeks after truth in earnest, yet even he will propose to himself such a kind of truth as shall yield satisfaction to the mind and understanding in rendering causes for things long since discovered, and not the truth which shall lead to new assurance of works and new light of axioms. If then the end of the sciences has not as yet been well placed, it is not strange that men have erred as to the means.

[...]

XCV

Those who have handled sciences have been either men of experiment or men of dogmas. The men of experiment are like the ant, they only collect and use; the reasoners resemble spiders, who make cobwebs out of their own substance. But the bee takes a middle course: it gathers its material from the flowers of the garden and of the field, but transforms and digests it by a power of its own. Not unlike this is the true business of philosophy;

for it neither relies solely or chiefly on the powers of the mind, nor does it take the matter which it gathers from natural history and mechanical experiments and lay it up in the memory whole, as it finds it, but lays it up in the understanding altered and digested. Therefore from a closer and purer league between these two faculties, the experimental and the rational (such as has never yet been made), much may be hoped.

XCVI

We have as yet no natural philosophy that is pure; all is tainted and corrupted: in Aristotle's school by logic; in Plato's by natural theology; in the second school of Platonists, such as Proclus and others, by mathematics, which ought only to give

definiteness to natural philosophy, not to generate or give it birth. From a natural philosophy pure and unmixed, better things are to be expected.

[...]

CXXIV

Again, it will be thought, no doubt, that the goal and mark of knowledge which I myself set up (the very point which I object to in others) is not the true or the best, for that the contemplation of truth is a thing worthier and loftier than all utility and magnitude of works; and that this long and anxious dwelling with experience

and matter and the fluctuations of individual things, drags down the mind to earth, or rather sinks it to a very Tartarus of turmoil and confusion, removing and withdrawing it from the serene tranquility of abstract wisdom, a condition far more heavenly. Now to this I readily assent, and indeed this which they point at as so much

to be preferred is the very thing of all others which I am about. For I am building in the human understanding a true model of the world, such as it is in fact, not such as a man's own reason would have it to be; a thing which cannot be done without a very diligent dissection and anatomy of the world. But I say that those foolish and apish images of worlds which the fancies of men have created in philosophical systems must be utterly scattered to the winds. Be it known then how vast a differ-

ence there is (as I said above) between the idols of the human mind and the ideas of the divine. The former are nothing more than arbitrary abstractions; the latter are the Creator's own stamp upon creation, impressed and defined in matter by true and exquisite lines. Truth, therefore, and utility are here the very same things; and works themselves are of greater value as pledges of truth than as contributing to the comforts of life.
[...]

CXXIX

It remains for me to say a few words touching the excellency of the end in view. Had they been uttered earlier, they might have seemed like idle wishes, but now that hopes have been raised and unfair prejudices removed, they may perhaps have greater weight. Also if I had finished all myself, and had no occasion to call in others to help and take part in the work, I should even now have abstained from such language lest it might be taken as a proclamation of my own deserts. But since I want to quicken the industry and rouse and kindle the zeal of others, it is fitting that I put men in mind of some things.

In the first place, then, the introduction of famous discoveries appears to hold by far the first place among human actions; and

this was the judgment of the former ages. For to the authors of inventions they awarded divine honors, while to those who did good service in the state (such as founders of cities and empires, legislators, saviors of their country from long endured evils, quellers of tyrannies, and the like) they decreed no higher honors than heroic. And certainly if a man rightly compare the two, he will find that this judgment of antiquity was just. For the benefits of discoveries may extend to the whole race of man, civil benefits only to particular places; the latter last not beyond a few ages, the former through all time. Moreover, the reformation of a state in civil matters is seldom brought in without violence and confusion; but discoveries carry blessings

with them, and confer benefits without causing harm or sorrow to any.

Again, discoveries are as it were new creations, and imitations of God's works, as the poet well sang:

To man's frail race great Athens long ago
First gave the seed whence waving harvests grow,
And re-created all our life below.

And it appears worthy of remark in Solomon that, though mighty in empire and in gold, in the magnificence of his works, his court, his household, and his fleet, in the luster of his name and the worship of mankind, yet he took none of these to glory in, but pronounced that "The glory of God is to conceal a thing; the glory of the king to search it out."

Again, let a man only consider what a difference there is between the life of men in the most civilized province of Europe, and in the wildest and most barbarous districts of New India; he will feel it be great enough to justify the saying that "man is a god to man", not only in regard to aid and benefit, but also by a comparison of condition. And this difference comes not from soil, not from climate, not from race, but from the arts.

Again, it is well to observe the force and virtue and consequences of discoveries, and these are to be seen nowhere more conspicuously than in those three which were unknown to the ancients, and of which the origin, though recent, is obscure and inglorious; namely, printing, gunpowder, and the magnet. For these three have changed the whole face and state of things throughout the world; the first in literature, the second in warfare, the third in navigation; whence have followed innumerable changes, insomuch that no empire, no sect, no star seems to have exerted greater power and influence in human affairs than these mechanical discoveries.

Further, it will not be amiss to distinguish the three kinds and, as it were, grades of ambition in mankind. The first is of those who desire to extend their own power in their native country, a vulgar and degenerate kind. The second is of those who labor to extend the power and dominion of their country among men. This certainly has more dignity, though not less covetousness. But if a man endeavor to establish and extend the power and dominion of the human race itself over the universe, his ambition (if ambition it can be called) is without doubt both a more wholesome and a more noble thing than the other two. Now the empire of man over things depends wholly on the arts and sciences.

For we cannot command nature except by obeying her.

Again, if men have thought so much of some one particular discovery as to regard him as more than man who has been able by some benefit to make the whole human race his debtor, how much higher a thing to discover that by means of which all things else shall be discovered with ease! And yet (to speak the whole truth), as the uses of light are infinite in enabling us to walk, to ply our arts, to read, to recognize one another – and nevertheless the very beholding of the light is itself a more excellent and a fairer thing than all the uses of it – so assuredly the very contemplation of things as they are, without superstition

or imposture, error or confusion, is in itself more worthy than all the fruit of inventions.

Lastly, if the debasement of arts and sciences to purposes of wickedness, luxury, and the like, be made a ground of objection, let no one be moved thereby. For the same may be said of all earthly goods: of wit, courage, strength, beauty, wealth, light itself, and the rest. Only let the human race recover that right over nature which belongs to it by divine bequest, and let power be given it; the exercise thereof will be governed by sound reason and true religion.

[...]

Book Two

XVI

We must make, therefore, a complete solution and separation of nature, not indeed by fire, but by the mind, which is a kind of divine fire. The first work, therefore, of true induction (as far as regards the discovery of forms) is the rejection or exclusion of the several natures which are not found in some instance where the given nature is present, or are found in some instance where the given nature is absent,

or are found to increase in some instance when the given nature decreases, or to decrease when the given nature increases. Then indeed after the rejection and exclusion has been duly made, there will remain at the bottom, all light opinions vanishing into smoke, a form affirmative, solid, and true and well defined. This is quickly said; but the way to come at it is winding and intricate. I will endeavor, however, not to

overlook any of the points which may help us toward it.

XVII

But when I assign so prominent a part to forms, I cannot too often warn and admonish men against applying what I say to those forms to which their thoughts and contemplations have hitherto been accustomed.

For in the first place I do not at present speak of compound forms, which are, as I have remarked, combinations of simple natures according to the common course of the universe: as of the lion, eagle, rose, gold, and the like. It will be time to treat of these when we come to the latent processes and latent configurations, and the discovery of them, as they are found in what are called substances or natures concrete.

And even in the case of simple natures I would not be understood to speak of abstract forms and ideas, either not defined in matter at all, or ill defined. For when I speak of forms, I mean nothing more than those laws and determinations of absolute actuality which govern and constitute any simple nature, as heat, light, weight, in every kind of matter and subject that is susceptible of them. Thus the form of heat or the form of light is the same thing as the

law of heat or the law of light. Nor indeed do I ever allow myself to be drawn away from things themselves and the operative part. And therefore when I say (for instance) in the investigation of the form of heat, "reject rarity", or "rarity does not belong to the form of heat", it is the same as if I said, "It is possible to superinduce heat on a dense body"; or, "It is possible to take away or keep out heat from a rare body."

But if anyone conceive that my forms too are of a somewhat abstract nature, because they mix and combine things heterogeneous (for the heat of heavenly bodies and the heat of fire seem to be very heterogeneous; so do the fixed red of the rose or the like, and the apparent red in the rainbow, the opal, or the diamond; so again do the different kinds of death: death by drowning, by hanging, by stabbing, by apoplexy, by atrophy; and yet they agree severally in the nature of heat, redness, death); if anyone, I say, be of this opinion, he may be assured that his mind is held in captivity by custom, by the gross appearance of things, and by men's opinions. For it is most certain that these things, however heterogeneous and alien from each other, agree in

the form or law which governs heat, redness and death; and that the power of man cannot possibly be emancipated and freed from the common course of nature, and expanded and exalted to new efficient and new modes of operation, except by the revelation and discovery of forms of

this kind. And yet, when I have spoken of this union of nature, which is the point of most importance, I shall proceed to the divisions and veins of nature, as well the ordinary as those that are more inward and exact, and speak of them in their place. [...]

XXXVI

Among Prerogative Instances I will put in the fourteenth place Instances of the Fingerpost, borrowing the term from the fingerposts which are set up where roads part, to indicate the several directions. These I also call Decisive and Judicial, and in some cases, Oracular and Commanding Instances. I explain them thus. When in the investigation of any nature the understanding is so balanced as to be uncertain to which of two or more natures the cause of the nature in question should be assigned on account of the frequent and ordinary concurrence of many natures, instances of the fingerpost show the union of one of the natures with the nature in question to be sure and indissoluble, of the other to be varied and separable; and thus the question is decided, and the former nature is admitted as the cause, while the latter is dismissed and rejected. Such instances afford very great light and are of high authority, the course of interpretation sometimes ending in them and be-

ing completed. Sometimes these instances of the fingerpost meet us accidentally among those already noticed, but for the most part they are new, and are expressly and designedly sought for and applied, and discovered only by earnest and active diligence.

For example, let the nature in question be the ebb and flow of the sea; each of which is repeated twice a day, and takes six hours each time, subject to some slight difference which coincides with the motion of the moon. The following will be a case of the parting of the roads.

This motion must necessarily be caused either by the advance and retreat of the waters, as water shaken in a basin leaves one side when it washes the other; or else by a lifting up of the waters from the bottom and falling again, as water in boiling rises and falls. The question is to which of these two causes the ebb and flow should

be assigned. Now, if we take the first, it follows that when there is a flood on one side of the sea, there must be at the same time an ebb somewhere on the other. To this point therefore the inquiry is brought. Now it has been observed by Acosta and others, after careful research, that on the shores of Florida and the opposite shores of Spain and Africa the floods take place at the same times, and the ebbs take place at the same times also; and not that there is an ebb from the shores of Spain and Africa when there is a flood on the shores of Florida. And yet if you look at it more closely, this does not prove the case in favor of the rising and against the progressive motion. For waters may move in progression, and yet rise upon the opposite shores of the same channel at the same time, as when they are thrust together and driven on from some other quarter. For so it is with rivers, which rise and fall on both banks at the same hours. And yet that motion is clearly one of progression, namely, of the waters entering the mouth of the rivers from the sea. It may therefore happen in a like manner that waters coming in a vast mass from the East Indian Ocean are driven together and pushed into the channel of the Atlantic, and on that account flood both sides at once. We must inquire therefore whether there be any other channel in which the water can be retreating and ebbing at that same time; and we have the South Sea, a sea at least as

wide, indeed wider and larger than the Atlantic, which is sufficient for the purpose.

At length then, we have come to an instance of the fingerpost in this case, and it is this. If we find for certain that when there is a flood on the opposite coasts of Florida and Spain in the Atlantic, there is also a flood on the coasts of Peru and the back of China in the South Sea, then indeed on the authority of this decisive instance we must reject the assertion that the ebb and flow of the sea, which is the thing inquired into, takes place by a progressive motion; for there is no sea or place left in which the retreat or ebbing can be going on at the same time. And this may be most conveniently ascertained by asking the inhabitants of Panama and Lima (where the two oceans, the Atlantic and Pacific, are separated by a small isthmus) whether the ebb and flow of the sea takes place on the opposite sides of the isthmus at the same time; or contrariwise, when it is ebbing on one side it is flowing on the other. Now this decision or rejection appears to be certain, if we take it for granted that the earth is immovable. But if the earth revolves, it is perhaps possible that in consequence of the unequal rotation (in point of speed) of the earth and waters of the sea, the waters are violently driven upwards into a heap, which is the flood, and (when they can bear no more piling) released and let down again, which is the ebb. But on this inqui-

ry should be made separately. Still, even on this hypothesis, our position remains equally fixed, that there must of necessity be an ebb of the sea going on in some parts at the same time that a flood is going on in others.

Again, let the nature in question be the latter of the two motions we have supposed, namely, the rising and sinking motion, if on careful examination we reject the former motion of which I spoke — the progressive. With regard to this nature the road branches into three. For the motion by which the waters rise in the flood and sink in the ebb without any accession of other waters rolling in, must necessarily be brought about in one of these three ways. Either there is an accession of water poured out from the interior of the earth, and again retreating into it; or there is no accession to the mass of water, but the same waters (without increase of quantity) are extended or rarefied so as to occupy a greater space and dimension, and again contract themselves; or there is no increase either of supply or of extension, but the same waters (the same in quantity as in density) are raised by some magnetic force attracting them from above, and by consent therewith, and then fall back again. Let us now dismiss the two former causes of motion and reduce our inquiry to the last; that is to say, let us inquire whether any such raising by consent or magnetic

force may happen. Now in the first place it is evident that the waters, as they lie in the trench or hollow of the sea, cannot all be raised at once for want of something to take their place at the bottom; so that even if there were in water any such desire to rise, it would be barred and checked by the cohesion of things, or (as it is commonly called) the abhorrence of a vacuum. It remains that the waters must be raised in one part, and thereby be diminished and retreat in another. Again, it will follow of necessity that the magnetic force, since it cannot act upon the whole, will act with the greatest intensity on the middle, so as to raise up the water in the middle; upon which the rest must follow and fall away from the sides.

Thus at length we come to an instance of the fingerpost on this subject. For if we find that in the ebb of the sea the surface of the water is more arched and round, the waters rising in the middle of the sea and falling away from the sides, that is, the shores; and that in the flood the same surface is more even and level, the waters returning to their former position; then indeed on the authority of this decisive instance the raising by magnetic force may be admitted; otherwise it must be utterly rejected. And this would not be difficult to ascertain by trial in straits with sounding lines, viz., whether during ebbs the sea be not higher or deeper toward the mid-

dle than during floods. It is to be observed however that, if this be the case, the waters must (contrary to the common opinion) rise in ebbs and sink in floods, so as to clothe and wash the shores.

Again, let the nature investigated be the spontaneous motion of rotation, and in particular whether the diurnal motion whereby to our eyes the sun and stars rise and set, be a real motion of rotation in the heavenly bodies, or a motion apparent in the heavenly bodies, and real in the earth. We may here take for an instance of the fingerpost the following. If there be found in the ocean any motion from east to west, however weak and languid; if the same motion be found a little quicker in the air, especially within the tropics, where because of the larger circles it is more perceptible; if the same motion be found in the lower comets, but now lively and vigorous; if the same motion be found in planets, but so distributed and graduated that the nearer a planet is to the earth its motion is slower, the further a planet is distant from the earth its motion is quicker, and quickest of all in the starry sphere; then indeed we should receive the diurnal motion as real in the heavens, and deny such motion to the earth. Because it will be manifest that motion from east to west is perfectly cosmical, and by consent of the universe, being most rapid in the highest parts of the heavens, and gradually falling

off, and finally stopping and becoming extinct in the immovable — that is, the earth.

Again, let the nature in question be that other motion of rotation so much talked of by philosophers, the resistant and contrary motion to the diurnal, viz., from west to east, which old philosophers attribute to the planets, also to the starry sphere, but Copernicus and his followers to the earth as well. And let us inquire whether any such motion be found in nature, or whether it be not rather a thing invented and supposed for the abbreviation and convenience of calculation, and for the sake of that pretty notion of explaining celestial motions by perfect circles. For this motion in the heavens is by no means proved to be true and real, either by the failing of a planet to return in its diurnal motion to the same point of the starry sphere, or by this, that the poles of the zodiac differ from the poles of the world; to which two things we owe this idea of motion. For the first phenomenon is well accounted for by supposing that the fixed stars outrun the planets and leave them behind; the second, by supposing a motion in spiral lines; so that the inequality of return and the declination to the tropics may rather be modifications of the one diurnal motion than motions contrary or round different poles. And most certain it is, if one may but play the plain man for a moment (dismissing the fancies of astron-

omers and schoolmen, whose way it is to overrule the senses, often without reason, and to prefer what is obscure), that this motion does actually appear to the sense such as I have described; for I once had a machine made with iron wires to represent it.

The following would be an instance of the fingerpost on this subject. If it be found in any history worthy of credit that there has been any comet, whether high or low, which has not revolved in manifest agreement (however irregular) with the diurnal motion, but has revolved in the opposite direction, then certainly we may set down thus much as established, that there may be in nature some such motion. But if nothing of the kind can be found, it must be regarded as questionable, and recourse be had to other instances of the fingerpost about it.

Again, let the nature in question be weight or heaviness. Here the road will branch into two, thus. It must needs be that heavy and weighty bodies either tend of their own nature to the center of the earth, by reason of their proper configuration; or else that they are attracted by the mass and body of earth itself as by the congregation of kindred substances, and move to it by sympathy. If the latter of these be the cause, it follows that the nearer heavy bodies approach to the earth, the more rapid

and violent is their motion to it; and that the further they are from the earth, the feebler and more tardy is their motion (as is the case with magnetic attraction); and that this action is confined to certain limits. So that if they were removed to such a distance from the earth that the earth's virtue could not act upon them, they would remain suspended like the earth itself, and not fall at all. With regard to this, then, the following would be an instance of the fingerpost. Take a clock moved by leaden weights, and another moved by the compression of an iron spring. Let them be exactly adjusted, that one go not faster or slower than the other. Then place the clock moving by weights on the top of a very high steeple, keeping the other down below, and observe carefully whether the clock on the steeple goes more slowly than it did on account of the diminished virtue of its weights. Repeat the experiment in the bottom of a mine, sunk to a great depth below the ground; that is, observe whether the clock so placed does not go faster than it did on account of the increased virtue of its weights. If the virtue of the weights is found to be diminished on the steeple and increased in the mine, we may take the attraction of the mass of the earth as the cause of weight.

Again, let the nature investigated be the polarity of the iron needle when touched with the magnet. With regard to this na-