

Nancy Brenner-Golomb

The Importance of Spinoza for the Modern Philosophy of Science

Can the revival of Spinoza's naturalism refute cultural relativism?

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Note on References.

Where I write [see p.#], the reference is to another page in this book. The references to Spinoza's work are indicated in the text, using the following abbreviations:

C. – The Correspondence of Spinoza.

E. – Ethics.

MT – Metaphysical Thoughts.

PCP – Principles of Cartesian Philosophy.

PT – A Political Treatise.

ST – Short Treatise on God, Man and his Well-Being.

TCU – Treatise on the Correction of the Understanding.

TPT – A Theological - Political Treatise.

The page numbers of these references are in the editions listed in the bibliography.

Abbreviation used in notes are indicated in the bibliography.

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FOREWORD:

THE PURPOSE OF THIS BOOK.

Reading Spinoza's work I was struck by his coming so close to the modern view of natural science, and in particular of physics after Einstein. This prompted me to examine whether Spinoza's approach to philosophy – which in his time was not differentiated from science – is also important for scientific disciplines dealing with human affairs. The question acquired a greater importance when I noticed that the recent interest in Spinoza appears to be related to the emergence of the *Enlightenment* as a most influential European cultural movement, which – as Jonathan Israel has shown – can testify to his influence. However, this influence is not prominent either in today's philosophy of science or in cultural studies. This fact seemed to me curious because the most serious critical appraisals of the approach to the scientific enterprise – seen as a product of the *Enlightenment* – were addressed by Spinoza.

One point of criticism, which is the essence of today's cultural relativism, says that propositions which scientists accept as self-evidently true, are in fact 'habits of thought' which are so deeply entrenched in our way of thinking that we fail to notice their origin in a particular culture. The expression 'habits of thought' was coined by Hume when he criticised Descartes' suggestion that 'clear and distinct ideas' could be taken as the foundation of knowledge. Hume was clearly part of the (Scottish) Enlightenment, and before him, Spinoza did not ignore this possibility which is endorsed today by cultural relativists. In the PCP he explains that Descartes knew that from our earliest days we are imbued with many preconceptions from which we are not easily freed. This was the reason, he says, that Descartes looked for those ideas which we cannot but affirm, and only then, if we take such ideas as axioms in science, they guarantee truth. Spinoza's objection was to Descartes' confidence that every person knows that "he has the power to control the will and thereby bring it about that it is restrained within the limits of the intellect" [Meditation 4, 35-42, quoted in PCP p.11]. Spinoza's rejection of this assumed power of the

intellect was based on his conception of human nature, by which he assigns different functions to the will and to the intellect. The essential point is that he derived this solution from his conviction that both functions – or rather *all* aspects of human nature – must contribute to the maintenance of human existence. Since this view fits so well the evolutionary view of life, I asked myself whether it was possible that the reason that the influence of Spinoza is not prominent in the domains of understanding humanity, is due to the lingering influence of the Cartesian differentiation between science, which according to him dealt exclusively with the explanation of the material world – the world extended in space – and the realm of thought, by which human affairs should be understood.

I wrote this book with the intention to examine whether the history of the philosophy of science supports this possible explanation. The importance I see in answering this question is that the rising influence of cultural relativism endangers the very survival of science as a whole. Hence the subtitle of the book.

INTRODUCTION

Following my purpose of writing this book as stated in the foreword, I try to show that the conception of knowledge associated with the Cartesian differentiation between science and human affairs *eventually* led to cultural relativism in the philosophy of science. I emphasise ‘eventually’ because obviously I do not ascribe this intention to Descartes. Even if my suggestion is correct, that it is his view – that science applies only to the physical world extended in space – that generated the historical process which eventually led to cultural relativism, it is absurd to blame him for the influence his ideas have had on later generations. A general problem involved in writing a book like mine is that if one wishes to understand philosophers who wrote more than three centuries ago it is imperative to consider the problems they faced in their own time. However, this does not mean that we have nothing to learn from their philosophy concerning problems we face today. What it does mean is that we must distinguish between the essential propositions in their philosophy, the rejection of which is the rejection of their whole approach, and those propositions which we may reject or ignore on the ground that they only responded to ideas of their time. This, of course, applies also to Spinoza. Even if Spinoza’s naturalistic philosophy is as important for our time as I suggest, it does not mean that all his propositions can remain intact more than three centuries after his death.

One example of necessary change is in the trust, which he shared with Descartes, in the unique status of Euclidean geometry as the only possible correct description of space. Another example is proposition XXVI in the appendix to the fourth part of the *Ethics* [E. IV], which says that we may destroy anything in nature according to our need to maintain our existence because it is natural for us to do so. This proposition is based on the assumption that planet earth is an unchangeable constant. Therefore it is reasonable *for us* to reconsider its validity in view of recent knowledge about the possible effect of human behaviour on climatic change or on the depletion of the earth of other forms of life, which are

likely to affect our existence. Another example, concerning his political science, is found in propositions 3) & 4) of the last chapter of his *Political Treatise* [PT], in which Spinoza argues that in a democracy women should be excluded from eligibility to any official position in the dominion, on the ground of their natural weakness. He argues that the subordination of women to the authority of men is unlikely to be due to social [cultural] institutions alone because had this been the case there would surely be found some nation in which they would be held of equal rights with men. This example contradicts his own claim that even if, in this case, the natural capacity of women to govern is equal to that of men, it does not mean that it cannot be suppressed by people in power, namely by men.

Nevertheless, for three reasons these propositions in Spinoza's philosophy do not diminish the importance of his *approach* to the philosophy of science. First, because although Spinoza agreed with Descartes that some concepts or basic principles can be understood by reflection alone, the reflection is always on what we know. For example, in his *Treatise on the Correction of Understanding* [TCU IV] he explains that our knowledge that the sun must be much larger than it seems to be is acquired by reflection on everybody's experience that when a thing moves further away from us it looks smaller. In general, his conception of objective knowledge is not the same as what is meant by objective truth, and it certainly does not mean independence of human experience. From Spinoza's definition of the mind follows that objective knowledge is knowledge derived from 'objects of perception'[see p.19], and truth is a judgements of reason. His deviation from Descartes in this respect is clearly stated in a corollary to proposition eight of the *Principles of Cartesian Philosophy* [PCP], where he comments on Descartes' theory of vortices. He rejects Descartes' idea that one can derive knowledge of the real world from abstract assumptions about it. In a letter to de Vries [C. IX], he explains that the main advantage he sees in his recommended method, as opposed to Descartes', is that it compelled him 'to attribute existence' to anything conceived by reflection alone. An advantage, he writes, "to which I award the prize." The attribution of existence' means

that, if philosophers, or scientists, postulate concepts or laws of nature by which reality can be understood, they ought to find entities or events in space-time that correspond to them. ‘Correspond’ in the sense that, for example, the mathematical formula of a parabola corresponds to the essence of a path of every projectile. This example is of particular interest because although, like Descartes, Spinoza considered the principles of geometry to be the best way to understand the essential structure of the world, unlike Descartes, he thought that there was no way of knowing a true essence of a thing without first knowing the thing itself. And this applied also to mathematical objects. He explains that we would not have had the clear and distinct idea about the essence of a parabola – its general equation – without first knowing parabolas. And we know parabolas because they exist [PCP III p.99].

The second reasons that our rejection of some particular propositions in Spinoza’s philosophy does not diminish the importance of his *approach* to science is that ‘reflection on what we know’ – namely on changes in science which occurred since the 17th century – implies that such changes have a necessary effect on changes in meta-scientific abstract concepts. A modern example, which uses arguments similar to Spinoza’s, is Einstein’s idea that his conception of space-time is derived from his new knowledge of this ‘object’ [see p.158 in chapter VI].

The third reason is that the main criterion Spinoza recommends for accepting any scientific method is not whether it can answer all questions, but whether it is the best way to look for such answers. This is explained already in his *Metaphysical Thoughts* [MT VIII]. After stating a series of questions troubling his contemporaries, like *Why are the impious punished if they are created by God's decree?* Spinoza notes that for such questions neither he nor Descartes have an answer, but adds that their purpose is not to explain these troubling questions but to inquire into what can be attained most certainly by natural reason [MT pp.125-126. See also his *Correspondence*, ©. LXXV)].

In summary, Spinoza’s rationalism does by no means imply a complete reliance on reason as opposed to empirical evidence. The

evidence provided by objective knowledge – in his sense of the word – is necessary because, as explained in TCU VIII, even in the best logical system, its *postulated* axioms are conceivably not true. And this is because a postulated essence of a thing does not imply its necessary existence [E. I prop.XXIV]. And the same applies to the study of humanity. In the PCP, in the section *The will should not be confused with appetite*, he comments on an argument [of an opponent of Descartes] that the faculty of the will cannot lead one to want what is contrary to the good prescribed by the intellect. He says that the claim that a person cannot judge something to be bad for him and yet will it, is *contrary to experience*. And as philosophers, we should acknowledge the fact that a person can very well will what he knows to be bad for him, and look for a natural explanation for this fact [see p.12]. Spinoza's letter to Oldenburg concerning Boyle's work [C. VI] makes clear that his objection to the empirical method developed in England was not to the conduction of experiments per se – he himself reports on experiments – but to the method's neglect to acknowledge that these experiments do not prove a mechanistic view of the world but presuppose it. And this presupposition is reached by rational reflection.

Yet, as stated at the beginning of this introduction, we must distinguish between those propositions which, in view of the development of science, we may reject, and the essential propositions, the rejection of which implies the rejection of the whole approach. The latter are the principles which, had they replaced the Cartesian conception of science, as dealing exclusively with the explanation of the material world extended in space and time, might have prevented the emergence of cultural relativism. Alternatively, had the present rising interest in Spinoza recognised that his philosophy was essential for *all* branches of science, including social and political science, this might have led to the rejection of cultural relativism. My support of these implications is the topic of this book.

In the following pages I summarise those propositions in Spinoza's

philosophy which cannot be changed without rejecting it altogether. In these summaries I emphasise, on the one hand, how they depart from Descartes [if they do], and on the other hand, their interpretation in modern terms, when this is possible. The latter turns out to be readily possible concerning what is called today natural science. In order to show why this seems impossible concerning his theory of mind and his social-political theory, I add two propositions which though not stated by Spinoza, are implied by his conception of human nature.

Substance and Attributes.

For Descartes, the universe consists of God and two independent substances, *Thought* and *Extension*. The natural world is the material world extended in space and time, and is the *only* domain of scientific study. For Spinoza there is only one substance, the conception of which is introduced in two definitions in the first part of his *Ethics*. Definition I says that substance is its own cause, and definition III says that *substance* exists and is conceived through itself. These definitions mean that the laws of nature are not God's Thoughts imposed on inert matter, but are the internal dynamic force of material existence – its *conatus*.¹⁾ God and Nature are the same and the only substance. There is nothing outside Nature. The structure of this substance is discussed in chapter IV.

Spinoza agrees with Descartes that *the attributes* of thought and extension must be distinguished, but only as distinct ways by which the same substance is conceived [E. I, note to proposition X]. They are distinct because neither can be understood in terms of the other. In a letter to Oldenburg [C.II], Spinoza explains this difference by reference to the then familiar problem of *universals*: the actual births of Peter or Paul

1) In a note to proposition 17 in the PCP [p.68], Steven Barbone and Lee Rice say that while Descartes wrote that every body that moves in a circle tends to move away from the centre, Spinoza changed the verb "tendere" to "conari" in accordance to the importance he assigned to his dynamic conception of internal power – the same conception of conatus in physics and psychology.

cannot be explained by our abstract knowledge of ‘humanity.’ A modern example is the distinction between understanding the abstract gravitation law and understanding particular movements in space under the influence of this force. For neither of them knowing the other is sufficient.

In modern physics since Einstein, the notion of matter-energy-in-space-time, where the hyphens indicate the unity of these components, can be seen as a recovery of Spinoza's idea of *substance*. It replaces the conception of each of these components as independent of the others as it was in Newtonian classical physics. By Spinoza's analysis, the separation of these components is due to the possibility to *conceive* them independently. Under the attribute of thought, these separately conceived components appear in the mathematical expressions of the laws of nature which account for their interactions. But, metaphysically speaking these interacting laws characterise the dynamic, self causing, nature of the universe. In modern cosmology this means that in an early stage in the history of the universe it was the internal forces of nature which caused its material formations, which Spinoza calls *the modifications of substance*.

The necessary distinction between substance and attributes [as explained in the earlier mentioned note to E. I proposition X] is due to the possibility of understanding Nature in many ways. Spinoza proposes that the number of attributes of God (Nature) is infinite. This can be understood as saying that Nature is conceivable, and therefore explicable, in an *indefinite* number of different ways. My replacing ‘infinite’ by ‘indefinite’ is derived from Spinoza's explanation that whenever the concept of infinity is applied to human understanding, it means *indefinite* [PCP pp.53-54]. In a letter to Meyer [C. XII], he contrasts this notion of infinity to its interpretation as ‘not finite.’ A thing can be finite only when limited by another thing of its own kind [TCU XV (III & V) and in definition II in E.I], and in the PCP [p.111] he explains that this notion of infinity applies to God because there is nothing of the same kind, outside God (Nature), by which it can be limited. But, concerning the number of attributes, this meaning does not apply. According to Spinoza, all we can say about the number of attributes is that *we* can conceive of only two

ways of explaining the modifications of substance (of matter-energy-in-space-time). *We* can understand any event *either* in terms of falling under some concept or law of nature, which is an explanation under the attribute of thought, *or* as caused by another event in space-time, which is an explanation under the attribute of extension. But whatever the number of ways by which understanding is possible, for knowledge to be correct, the different ways must be in agreement with each other [E. II prop.VII]. In other words, an explanation of an event by its proximate cause must agree with its explanation by the laws of nature, as shown by the example of the force and law of gravitation respectively. What Spinoza continues to find correct in Descartes' reliance on thought alone is that knowledge of those things which have no place outside the mind – like knowing that ‘nothing is produced from nothing,’ or that ‘all phenomena are governed by mechanical principles’ – are understood only under the attribute of thought, by reflection on what we know under both attributes. To abandon this idea of Spinoza means to reject him completely.

Essence.

Spinoza defines an essence as a property without which a thing can neither exist nor be conceived [E. II, definition II]. The discovery of an essence of any particular thing is the discovery of the dynamic forces [*conatus*] by which that thing exists. Understanding this essence is understanding an abstract principle, or law, distinguishable from understanding any instance of the thing's existence. The place of the concept of essence in modern science is discussed in chapter V. Here, it is sufficient to point out that Spinoza explains the natural origin of the concept by his analysis of perception. I think that this can be best understood by considering the distinction between Reality and realism implied by an analysis corresponding to his distinction between substance and attributes.

‘Reality’ is Nature as it is, and ‘realism’ is the way we perceive and understand it. From Spinoza's conception of the attributes follows that all things and events are understood by means of abstract concepts and laws

of causation. This way of understanding characterizes realism. It does not apply only to science and philosophy, but also to ordinary perception when conscious thought is not involved. He considers, for example, the identification of Peter [TCU VI]. Since the appearance of the real Peter changes all the time, the mind *must* abstract some essence of Peter by which we recognize him. ‘Must’ is emphasised because we do not know what this essence is, but we do know that without an unconscious recognition of such an essence we would have been unable to recognize Peter as being the same person in spite of his variable appearances. In chapter IX Dawkins explains the same idea in genetic terms in the animal world.

Reality is the continual existence of the universe in all its details [E.I, note to proposition xxviii]. To speak of essences as expressing God's Thoughts, as if these abstract concepts are more real than perceivable phenomena, is to speak anthropomorphically [E. II, note to proposition III]. If we insist on thinking in this way, we may think of God metaphorically as a Being whose self-knowledge is so complete, that being aware of all interactions in all places at once, he does not need to reduce the objects of its self-knowledge to their essential features in order to understand them. *We* need to classify things and events as similar in some respects – i.e. as described by some universal property or law – because we are not capable of grasping the indefinite number of interactions which give rise to them. For example, we can grasp the activity of the force of gravity only by conceiving this essential principle as underlying all motion in space, but we cannot possibly grasp its simultaneous interactions with other forces in all particular objects or events. We cannot grasp them because although this law represents a principle by which all these objects and events exist, in Reality each of them is unique because the number of different interactions of essential principles is indefinitely large. In short, realism is our way of understanding Reality by abstracting essential features by which we perceive similarities or regularities, as explained in TCU V.

Spinoza did not explicitly state the distinction between Reality and

realism, but its implication is important because it clarifies that the natural way by which the human mind classifies things as similar in some respects provides the possibility of understanding, which at the same time limits it. This limitation is because a natural classification is confined to the way by which natural things act upon us [MT p.130]. This is clarified in the next section on the place of thinking in human nature. Here, it is sufficient to point out that, while rejecting the distinction between Reality and realism is a total rejection of Spinoza's conception of essence, any particular conceived essence can change in the light of knowledge of new things which affect us. For my purpose in this book, the latter is important because when some aspects of Spinoza's philosophy were revived in the 19th century, this distinction was largely ignored. For example, Hegel's conception of the *Absolute Spirit* seems to be an interpretation of Spinoza's conception of *conatus*. Like Spinoza, Hegel thought that philosophical understanding is understanding the essential features of the world without reference to the particular relations between perceived objects, which obviously take place in particular places and time. In Hegel's philosophy, understanding the self-causing world where humanity is concerned, is understanding the process by which the *Absolute Spirit* is self-realised. The process is described by the essential phases of History. In other words, Hegel's conception of History postulates an overall 'plan' inscribed into it, irrespective of the influence which the interactions of the people living within the particular societies in each phase might have on its structure. This is discussed in chapter XI, in connection with Marx's correction of Hegel's idealism which is closer, but not identical, to Spinoza's view.

The place of thinking in human nature .

In the PCP Spinoza tells us that, while resolved to doubt everything that can be doubted, Descartes concluded that what he could not possibly doubt was the existence of himself doing the doubting. Hence, in "*I think therefore I am*" he found a proof of the existence of his own thinking-self.

Spinoza's first comment is that, though true, this most certain assertion is not a *logical* proof, because it is discovered without reference to any other premise [PCP pp.9-10]. Instead, *thinking* is recognised as an essence of our natural being, discovered by introspective self-awareness. The similarity between the derivation of this essence from what we know about ourselves and the derivation of the gravitation law from what we know about motion is that neither can be derived from other known premisses. They are, therefore, propositions which must appear as axioms in a theory of mind and a theory of the physical world respectively. The difference between them is that only about the former we cannot have any doubt, in spite of its being discovered by reflection alone. This conviction, that there is some knowledge which can be known by reflection alone, keeps Spinoza's place in the 'rationalist camp.' Yet, there is an important difference between his and Descartes' rationalism. According to Spinoza, even this knowledge is derived by reflection on 'objective knowledge,' namely on what we know about ourselves.

The second comment of Spinoza on Descartes' *cogito* says that, since he discovered that thinking is our essence – namely a property by which we exist and understand ourselves – a better formulation of his conclusion would be "*I am as long as I think.*" And an even better formulation is derivable from the note to proposition xiii in E. II, that the more one interacts with one's environment the more mind one has: "I am a human being, capable of all the variety of interactions with my environment which my nature permits, as long as I think". The last formulation is discussed in chapter IV, where *The Structural View* suggested by Spinoza's naturalism is discussed, and in chapter XIV, on Damasio's view in the spirit of Spinoza. Here it is sufficient to note that these re-formulations of the *cogito* express Spinoza's conception of what he calls the active mind. The 'objects' of the active mind are ideas. Not all mental operations are modes of thinking. As shown by the perception of Peter, we are not even conscious of 'the idea' that is Peter's essence. In TCU XI he explains that perceiving an image or a memory differ from modes of thinking because they can be understood under the attribute of

extension, namely by causal processes in the brain's space [see also MT I, *Of Real Being, Fictitious Being and Being of Reason*].

Spinoza's definition of the mind is stated in E II, proposition xiii. "The object of the idea constituting the human mind is the body or a certain mode of extension actually existing and nothing else." In order to understand this proposition we must first note that 'the idea constituting the human mind' means the *concept* of the mind by which we understand our mental experience. The 'nothing else' is to be understood by his claim that any idea we have must 'correspond' to our knowledge of its object under the attribute of extension, where the notion of 'correspond' is as explained on p.11, in connection with knowing parabolas. We can understand the meaning of 'the object of an idea ... is the body' by considering consciousness of feeling too hot or being hungry. The feeling is what we are conscious of when certain physical changes occur in the body. However, while modern natural scientist equate these feeling to the processes in the body which produce them, on the grounds that they are fully explained when these processes are understood, Spinoza objects to this identification. According to him, these feelings are categorised as kinds of pain – a general term describing transitional states of the body by which its power of action is reduced [E. III, Definition III and the explanatory note]. They are always combined with an idea of its cause and a desire to restore the body to its natural capacities. Together they constitute the complex idea whose object is the tendency of a person to behave as to relieve himself from the heat or assuage the pain of hunger.

Note that while the feelings described above enter a theory of mind as universal, common to all human beings independently of their particular experiences, the actual behaviour for relieving excess heat or assuaging hunger depends on knowledge how to do so. Hence, the objects of the ideas constituting this knowledge are 'certain modes of extension actually existing' outside the mind. The specialty of 'having more mind' is that this knowledge cannot be universal. If it were universal to our species, it would have meant that perception of these modes of extension outside the

mind was sufficient for survival. This is important because the same applies to the distinction between the universal capacity to think logically, and rationality: if having more mind is a result of more interactions with the world, then rational behaviour must mean taking account of one's own specific interactions. This is discussed in Chapter VIII.

'A mode of extension actually existing' applies to what Spinoza describes as a cause of an emotion. Comparable to a natural scientist's identification of feeling warm or hungry with the physical processes which cause it, modern psychologists identify, say, falling in love with hormonal states of the body, and the external causes of these body-states. For example, some of them identify the cause of these hormonal states as 'chemical affinity' of the smell of the beloved, say, with its pleasing effect on the lover. However, the conscious feeling of love is certainly not consciousness of either hormonal or chemical processes, even if these correctly describe its causes. The feeling, as Spinoza says, is of loving the *perceived* cause of the emotion, namely another person existing outside the mind. And the same applies to other emotions. They are partly an effect of universal processes in the body and partly the effect of particular perceived causes.

In short, the concept of 'the mind' is an idea by which we understand ourselves – our *conatus* – as thinking beings. It is an essence of our being because it characterizes one of the forces, or processes, by which we preserve our existence. The correspondence of the mind to our *conatus* is stated in proposition xi in E. III: "whatever increases or diminishes, helps or hinders the power of action of our body, the idea thereof increases or diminishes, helps or hinders the power of thinking of our mind." For example, it is consciousness of pain [the idea] that reduces the power of thinking. An inherent function of the mind is to reduce pain. But as explained in connection to feeling hungry, the capacity to reduce pain depends on knowledge how to do it. Creating this knowledge is a major function of thinking, and it ought to be the purpose of science [TCU II].

A generalization of this example is that, in its capacity to create the

knowledge needed for maintaining our form of existence, the essence of the mind is to create and maintain a coherent system of true ideas. Spinoza derives this essence of the mind from his remarkable correction of Descartes' reliance on the existence of God as a condition for his rationalist methodology [PCP pp.11-14]. The essence of this correction is that what we need to know in order to make sure that our created knowledge is true, is not that God exists, as Descartes thought, but that without a true *idea* of God we cannot be certain of anything. Not even of the truths of mathematics. Only with such an *idea* of God, which in modern terms is equivalent to the idea of the *Unity of Nature*, can we trust our understanding of any other idea which, as he says, has no room outside the mind. This applies not only to the truths of mathematics but also to beliefs such as 'the world is mechanistically explicable' or 'nothing is created out of nothing.' We can trust such ideas, in spite of reaching them under the attribute of thought alone, because they are central to the creation of a unity of science – an idea whose 'object' is the unity of Nature. With this correction of Descartes's conception of God, Spinoza discovered an essence of understanding: a basic tendency to understand the world as a unique *structured* system, as he explains in TCU VII. This is discussed in chapters II to IV. And concerning mathematics, it is discussed in chapter VI.

Needless to say, Spinoza did not know what can be the 'object' in the body – or the process in the brain, as a modern neurologist would say – which corresponds to the tendency to create a unified system of ideas. If pressed for an answer, by analogy to his explanation of a hidden, innate, knowledge of an essence of Peter, all he could have said would have been that his naturalist metaphysics implied that such an 'object' must exist. What he claims to have discovered is the fact that the creation of knowledge is guided by this tendency, which includes the tendency to turn to reason when one becomes aware of inconsistencies in the created unified system. He discovered that ideas occur involuntarily in the mind, and that the function of reason is to reject those which are 'guilty' of creating inconsistency, as the first axiom in part V of *Ethics* says. This is

discussed in chapter X.

The modes of thinking which must be retained if Spinoza's approach is adopted are those which have an essential function in preserving human existence. These essential constituents of the mind are 'intuition,' 'the will,' 'free will,' 'the intellect' and 'the principle of justice and charity.' The latter is at the roots of moral philosophy.

Intuition.

According to Spinoza, knowing something by intuition is knowing it with certainty, even if we cannot prove it either empirically or logically [E. II, note II to proposition xl, and proposition xliii]. With this conception he intended to correct Descartes' assertion that we can be certain about our clear and distinct ideas. Descartes was not oblivious of the effect of prejudice on understanding. In fact, his recommendation to start from doubting everything that *can* be doubted, stemmed from his recognition of this effect. But he thought that starting from ideas appearing clear and distinct in his mind provided a guaranteed escape from these effects. Spinoza rejected this assumed guarantee because he distinguished between ideas that *cannot* be doubted because they are naturally known – ideas which may be described as innate – and ideas that *are* not doubted due to the external influence of other minds. According to him, only the former are known by intuition, and since they *cannot* be doubted, only these ideas can guarantee an escape from the influence of those minds which have the power to impose their own ideas on others. The difficulty is in discovering which are the ideas known by intuition. This is discussed in chapter VI. Here it is sufficient to note his explanation in TCU VII, that to say that a true statement is known by intuition does not mean that it is in the forefront of everybody's thoughts. It only means that if somebody stumbles upon it by chance, as he says, he knows that no argument or evidence are needed for ascertaining its truth. This is the meaning of its

being self-evident.²⁾ For example, by reflecting on what we do when we infer something which we have not known from something we know, we discover the principle of inference. Our certainty stems from the fact that we *use* inference even without being aware of this principle [TCU XIV]. In other words, anticipating the criticism of cultural relativists, Spinoza's argument is that we discover the principles of logic by reflecting on what we must have intuitively known when we used them. A particular person may or may not discover them, and the skill of logical reasoning may or may not be dominant in a culture of any particular society. But there is no culture in which people do not *use* the principles of inference and negation, which together are the basic principles of logic.

According to Spinoza, the natural tendency to use reason must stem from a natural desire to know the correct causes of things. Unfortunately, as explained in later theses characterizing the modes of thinking, this desire is often suppressed by other desires of the same or other people.

The Will

According to Spinoza, the will is the power of the mind to produce actions. It is a natural drive that is active in every behaviour experienced as voluntary. But just as the force of gravitation does not exist separately from all bodies which 'experience' it, so the will does not constitute a separate faculty of the mind in which freedom might reside [E. II note to proposition XLVIII]. Nevertheless, the necessary distinction between the conception of the will from the experience of the drive of willing, is concisely explained in Spinoza's correspondence with Oldenburg [C. II]. 'The will,' he writes, differs from this or that state of volition, as the concept 'white' differs from this or that perceived white thing, or as 'humanity' differs from this or that man. Since 'the will' is a concept, it

2) The use of self-evident axioms was criticized also by Francis Bacon in his *Novum Organum*, but, his criticism being so early, is irrelevant for my purpose. For Spinoza's view of Bacon's criticism see letter II in his correspondence. All my references to his correspondence are correct for any edition after 1882.

is as impossible that it causes this or that act of volition, as it is impossible that ‘humanity’ causes the birth of Peter or Paul. ‘The will’ is ‘a concept which the mind forms by reason of its being a thinking thing.’ It represents an essence by which we understand ourselves, and, like any other known essence, we know it under the attribute of thought. However, he adds, it is obvious that if there were no acts of volition, the concept of ‘the will’ would be empty.³⁾ The concept, then, is not empty because acts of will exist that are characterized by the concept as their essence. Since we know that every event in space-time is determined by a cause, we know that such acts of will need causes in order to occur. And we also know, that because the act is determined by a cause, it is necessarily as it is.

That the will is to be conceived as part of the mind is explained in the MT (p.137), in the section *Why some think that the will is not free?* There, he responds to some followers of Descartes who thought that the will was not free because if acts of will were causally explicable as any event in the body, they had to be distinct from the mind. Spinoza rejects this view because to say that a person is a thinking being means that *whenever an idea is involved* in the determination of an action, reason may deny it if necessary. In general, we are conscious of desires and of the will to satisfy them. We perceive causes of pleasure and pain, and are conscious of the will to reinforce the former and reduce the latter. These are the same reasons given against the physicists’ identification of feelings with processes in the body [see pp.19-20]. It follows that an explanation of an act of will is not exhausted by a causal account of movements in, or of, the body. It includes the feelings, the desires and the perceived causes involved. In such cases, reason may interfere by denying their perceived causes.

The phrase ‘whenever an idea is involved’ is emphasised because,

3) This is reminiscent of Kant’s famous idea that concepts without sense-perception are empty but sense-perception without concepts is blind. Incidentally, with his explanation, Spinoza resolves the notorious problem of universals - that they do not refer to anything real - because he explains what is meant when we say that such concepts correspond to the facts [see p.11].

according to Spinoza, the mechanistic view of the world can explain many human drives without reference to consciousness, let alone to reason. In the *Ethics* [E. III, note to proposition II] he points out that “no one has yet been taught by experience what the body can do merely by the laws of nature in so far as nature is considered merely as corporeal or extended, and what it cannot do, save when determined by the mind.” And he explains further that “*the body* can do many things by the laws of its nature alone at which the mind is amazed... no one knows in what manner, or by what means, the mind moves the body ... when men say that this or that action arises from the mind which has power over the body, they know not what they say...”. In his example of perceiving Peter [see p.18] the idea of his essence is not involved in the determination of our actions concerning him. Only by reflection we know that our brain must derive this essence while we remain ignorant of the process.

Free Will.

In the same section of the MT cited above, Spinoza explains that, while an act motivated by a passion is determined by external causes, when the mind turns to reason for affirming or denying any idea, it remains free because "no [external] thing has the power to destroy its essence [as a thinking being]". [This explanation reappears in E. II propositions 48&49 and notes]. Freedom is acting by the necessity of one's nature alone [E.I, Definition VII]. And turning to reason when problems arise is in the nature of man. Hence, when a person turns to reason he is free, even though exercising reason is also acting by necessity: while an event in the body is necessarily determined by other events causing it, an idea is necessarily determined by other ideas. This is further discussed in chapter VII. Here it is only necessary to note that one way to understand Spinoza's conception of *free* will, or possible choice, is to relate it to the role he assigns to *reason* in human nature.

The role of reason is different from that of ‘the will,’ but like all properties of the mind, it must be understood as necessary for survival.

This necessity is derived from Spinoza's assertion that the more one interacts with one's environment [in various ways] the more mind one has [see p.18]. More mind means more ideas, some of which might contradict others. Thus, some ideas must be rejected or modified if the ultimate function of the mind is to guide behaviour consistently. According to Spinoza, once we accept his naturalistic metaphysics, we are bound to accept that free will means no more than freedom from external influence. Surely, he argues, everybody agrees that God is free. But from the identification of God with Nature follows that this freedom only means that nothing outside Nature has any effect on God's actions. By analogy, we are free only when we act according to our natural capacities without external influence. His favourite example is that we are not free to reject the idea that the sum of the angles in a triangle is equal to two right angles. But neither can the origin of this knowledge be anything but our own understanding.

The crucial point is that the mind is not free to *reject* an idea which follows logically from something which we *accept* as known. The *acceptance* of a new idea depends on the status of what we have already accepted as known. It follows that the difference between systems of reasons rests on whether we start from premisses which we cannot reject – namely with necessarily true premisses – or from premisses which seem to be necessarily true but might have been imposed on our minds by external influence [TCU section VI]. For example, contrary to the theorem about the triangle, a person may accept reasons which lead to the denial of the importance of riches for happiness. And if he does so, his change of mind about the causes of happiness affects his actions.

Spinoza's example of a *seeming* true premiss is found in the appendix to part I of the *Ethics*, where he explains how people have come to a mistaken conception of God, as imposing his will on nature, implying that he can do otherwise in response to prayers and worship. The importance of this example for Spinoza's philosophy of science is that it is the power of institutional religion which makes sure that this mistaken conception of God remains well established in people's mind as a standard

of truth for *all* other ideas, not only moral but also philosophical, or scientific, propositions.

The Intellect.

‘The intellect’ represents an essential human capacity to understand things under the guidance of reason *alone*. Like the concept of ‘the will,’ the concept of ‘the intellect’ would have been empty without instances of being guided by reason alone. Its influence on human behaviour is due to a capacity to keep the mind on reason. Since we are free only when we follow reason, it follows that this capacity and *free* will are the same. In the TCU Spinoza explains that with his attribution of the power of reason to human nature he does not claim to improve on the idea that everything proceeds from cause to effect. His claim is that just as events in space are caused by other events in space, so reasons follow from other reasons, resembling *a spiritual automaton*. He does not call this mental process ‘causal’ because the concept of ‘a cause’ is reserved for events in space and time. In the realm of thought we call it ‘a reason,’ because we do not know the ‘instrumentality’ [of the brain] which corresponds to it. In a letter to de Vries [C IX] he explains that the difficulty of understanding the activity of the intellect is in the fact that this understanding as well as the reasons (the ideas) upon which the intellect acts are in the realm of thought alone, as opposed to instances of volition which can be understood under the attribute of extension as well, namely in terms of events in the brain.

The influence of the intellect on human behaviour is limited because it rests on the function of reason to resolve contradictions between *current ideas*. In a letter to Oldenburg [C. II] Spinoza objects to Bacon’s statement that the will is free – for reasons already explained – but accepts his argument that it is wider in scope than the intellect. This is also explained in a letter to Blyenbergh [C. XXI]: if the power of our will were not extended beyond our limited power of the intellect, he wrote, we would not have been able to eat a slice of bread or to move a single step,

because all things are uncertain and full of danger.

Two points are important. One is that while the *capacity* to keep the mind on reason represented by ‘the intellect,’ is – like the capacity to turn to reason – common to all humanity, most human thoughts are as particular to one person as are acts of will, or even as particular events in a person’s body [E. I, note following Corollary II to proposition xvii, and its appendix]. This is the explanation of subjectivity. The second point is that the power of the mind to accept or reject ideas can apply *only* to variable ideas because, concerning either ideas known by intuition – which, as explained in the section about it can be interpreted as innate – or those derived from them by reason, we have no choice but accept them. Only ideas whose source is external to the mind can be variable. And most important for the philosophy of science, is his explanation that this also applies to an accepted standard of truth which *seems to be* necessarily true, although it is based on the mistaken conception of God, imposed on the minds of most people by the external power of institutional religion. This is an important theme in the Treatise on Politics and Theology [TPT].

An important aspect of the distinction between the function of reason and the function of the intellect – of keeping the mind on reason – is that only by keeping the mind on reason philosophers and scientists can become aware of the tendency of the mind to create a unified system of ideas. Only by keeping the mind on reason, they can become aware that the purpose of science is to make sure that this created system is of true ideas, and that this is only possible if its premisses and standard of truth are correct. This is explained in the TCU and summarised in section VII. However, he also explains the difficulty to reject a well established standard of truth even if it is false. He explains that it was from his mistaken conviction that the human soul was part of the substance Thought, that Descartes derived his confidence that, once a philosopher keeps his mind on reason, the true thoughts which God inserted in his soul were bound to appear clear and distinct to him. Therefore he concluded that we can refrain from error provided we undertake to affirm nothing except that which we either perceive clearly and distinctly or that which

follows logically from such premises. [PCP Prolegomenon, about doubt and part I Proposition 14]. According to Spinoza, the difficulty is shown by the fact that even ‘the illustrious Descartes’ did not reject the mistaken idea of God.

In the modern philosophy of science [without reference to Spinoza] this idea has been generalized by Thomas Kuhn’s concept of a paradigm.⁴⁾ The generalization says that even when engaged in science, one always starts with some well established view which is taken for granted.

In short, Spinoza’s postulated natural function of reason is to distinguish between true and false ideas as they occur, so to speak, one at a time. The function of keeping the mind on reason is the task of philosophy. The task of intellectuals is to discover false ideas presupposed in a paradigm, to correct them and thus create a correct comprehensive understanding of the world which can correctly guide the creation of true science. This is the topic of the TCU.

The title of the TCU is "on the *correction* of the understanding" because, according to Spinoza, although starting from a taken for granted view is natural, by reflection we can correct it even if initially only under the attribute of thought. The idea to this effect is found in a note to PCP I, 14. In this note, he responds to the claim of critics of Descartes, that since everything is caused by God, having an erroneous idea is also caused by God. This was supposed to imply God's responsibility for errors. Spinoza’s answer is that there is no error involved in asserting a perception of even an imagined unicorn. The error is in affirming its real existence. By experience we know that we affirm many things that we have not deduced from the certainty of first principles. And since we also know that this is a source of error, we know that there is a good reason for God’s giving us the power of reason.

Replace ‘God’ by ‘Nature,’ and we have a natural explanation for both the willingness of some people to keep their mind on reason, and the

4) *The Structure of Scientific Revolutions*, University of Chicago Press, 1962

reluctance of most people to do so. Spinoza explains that the former follows from a natural desire to seek knowledge which would increase our power of action [see p.20], and the latter follows from the natural desire of a social human being to conform to common views. Both are bound to be observed in all cultures. But while it is from this observation that cultural relativism is derived, Spinoza explains yet another mode of thinking which underlies them.

The Principle of Justice and Charity

In part IV of the *Ethics*, proposition xxxvii says: "The good which each one who follows virtue desires for himself, he also desires for other men, and the more so the more knowledge he has of God". In two notes to this proposition Spinoza explains, that in this case, knowing God [Nature) is knowing that people are naturally driven by conflicting emotions and that only if driven by reason, can these conflicts be overcome. To be *driven* by reason is possible because consulting reason is a natural way for judging whether things are true or false, which in this case means truly good or bad for our social life. In these notes he argues that, had individuals lived in isolation, it would have been natural for them to consider only their own advantage, so that no action would be considered morally good or bad. The origin of morality is the intuitive knowledge that we need each other's help. The principle of justice and charity is an abstract concept representing a universal desire of social beings to live in a society which satisfies this need. This is the function of morality. In the second chapter of his Political Treatise [PT], Spinoza repeats his explanation in these notes, that morality, with its concepts of sin and virtue, as well as politics with its concepts of law and justice, apply only in civil society. Their importance is to maintain the integrity of the state by imposing obedience to its laws. The same applies to religious rites.

The problem dealt in his political writing is that the same intuition, that we need each other's help, is also the origin of the natural tendency of people to succumb, or conform, to social pressures. By analogy to his

argument in TCU I [discussed in the next chapter], people are ready to succumb to the laws of their society, not because they consider this behaviour good, but they consider them good because they desire the peace and security which only these laws can provide. In the cited notes in E.IV, Spinoza explains that the source of the need for social regulation, involving a degree of inevitable coercion, is due to the universal [psychological] tendency to refrain from doing evil only in fear of a greater evil, and the readiness to forgo an immediate good is only in expectation of a greater good. Therefore, law and order can only be maintained by acknowledging this law of human nature. This is why all political decisions – even if supported by reason – must be enforced by ‘prizes and threats.’

In PT II [13-14] Spinoza explains that people’s knowledge that they need each other’s help means knowing that together they have more power than they have separately. Being more cunning than other animals, they also know that when guided by their passions they are natural enemies for each other. However, in response to Hobbes' postulated *social contract*, by which people willingly surrender their rights to the sovereign state, he explains in a letter to Jarig Jelles [C. L], that the difference between him and Hobbes is that he [Spinoza] preserves the natural rights of people intact. A ‘natural right’ is a *concept* the object of which is an actual natural power, which in this case means the natural power of reason. Spinoza’s assertion in the letter, that he preserves peoples’ natural rights is his assertion that only when people do not lose their natural power of reason, they can see the *advantage* of surrendering to the power of a state. Only then, the natural right of the state, namely its actual power to impose its laws on its subjects, is accepted by agreement. This, he says, is the difference between subjects and citizens [PT III 1].

It is worth adding that as far as the philosophy of science is concerned, the principle of justice and charity is at the roots of social science, which in

Spinoza's time was included in moral philosophy.⁵⁾ His thesis that understanding nature – the universe as a whole – and understanding ourselves are mutually related convinced him that moral philosophy, namely social and political issues, ought to be included in the same scientific project. As pointed out above, the only difference between being guided by the authority of truth in the natural sciences and in the social-political sciences is that in the latter a proposition is true when it proposes what is truly-good for enabling us to live by our natural powers in peace and security. Judging what is 'truly good' is the same as making a rational choice. In PT, III, 6, he explains that the occasional need to do something against one's own good is in this case offset by the greater good derived from the existence of a civil dominion. It follows that the purpose of moral philosophy is to discover the best way to live in society, while taking account of human nature.

It also follows from Spinoza's conception of science that the idea that science is value free is a misunderstanding. The value of the authority of truth, as outlined in TCU III, is the value of discovering the laws of nature which are independent of human actions. But the value of discovering what is truly good for us does depend on human actions. What Spinoza discovered is, that although the basic universal desire underlying this value is to live by one's own powers in peace and security, the basic obstacle to its realization is that people in positions of power tend to use their power for imposing the idea on other minds that the best way to satisfy their natural desire is to adopt a policy which is advantageous for themselves, i.e. to the people in power. In TPT XVII he says that a powerful sovereign is one who induces his subjects to believe what he believes, to love what he loves and share his other emotions.⁶⁾ In his PT [chapter V 5] he generalizes to all people in power, and concludes that

5) Adam Smith still taught what today we call economics under the title moral philosophy.

6) Max Weber (1910) defined the concept of charisma as the impact of a visionary leader which transforms the outlook of his followers and induces them to identify with him from a humble distance.

every political theory should aim at the prevention of this *wickedness*. The question is what he means by ‘wickedness,’ because in the first chapter of the PT, he states that he does not treat the passions as vices but as natural motives of behaviour. He explains that his intention is to demonstrate that a sound political science can and ought to be based on what is known of both human nature and political practice. What his study of human nature taught him is that passions are stronger than reason. Therefore, what he means by the wickedness of people in power is that when they design the rules for preserving the integrity of the community, they can never be free from subjection to their passions.⁷⁾

Before embarking on stating those theses of Spinoza which cannot be changed without rejecting his whole philosophy [see p.13], I said that these are the propositions which, had they replaced the Cartesian conception of science as dealing exclusively with the explanation of the material world extended in space and time, the emergence of relativism might have been prevented. Alternatively, if the present rising interest in Spinoza will recognise that these principles are essential for *all* branches of knowledge, it might lead to the rejection of cultural relativism today. Therefore, what I need to show in this book is, on the one hand, that the inclusion of all knowledge in the scientific project is the main difference between Spinoza’s and the modern conception of naturalism in the philosophy of science, and on the other hand, I must show how it happened that the Cartesian conception of science prevented Spinoza’s naturalistic approach outside the natural sciences.

‘The one hand,’ is discussed in chapter II. Here I want only to add the following notes. First, the essence of Spinoza’s meta-scientific

7) That this assessment of power does not apply only to social affairs can be seen even in the current preoccupation with the apparently pure scientific problem of global warming. *Apparently*, because the controversy whether or not human activity has any bearing on it, and if it does have an effect on it, what actions are necessary or possible for reversing the trend, is complicated by the suspicion that people in various positions of power try to ‘persuade’ the public that the best policy is that which is advantageous for themselves.

approach is that understanding nature *can* be improved, but being a long term social enterprise, this improvement can only be achieved if the benefits as well as the social and psychological obstacles to this improvement – i.e. to the creation of science – are understood. And the latter *can* only be understood with a greater understanding of human nature. This is the topic of his TCU, of which the subtitle is *And on the way in which it may be directed towards a true knowledge of things*. Therefore, since it is the approach to science, rather than his particular propositions, that is important for combatting relativism [see p.9], in chapter I, on Spinoza's methodological approach I put a greater emphasis on the TCU than one would do if the purpose was to elucidate his views. This is worth noting because at the end of this essay, the editors who published Spinoza's work after his death considered it unfinished and added the remark 'The remainder of this Treatise is wanting.' However, whatever were the editors' reasons for adding this remark, none of Spinoza's other books indicate that he changed his mind about the approach recommended in this essay.

The second note is that Spinoza's emphasis on the psychological and social conditions for carrying out the scientific project successfully suggests that the relativists' emphasis on the influence of culture on all thoughts should not be simply dismissed, as most natural scientists tend to do. Instead, we should follow Spinoza's example of his response to the skeptics' criticism, in TCU VIII, and seek natural explanations for the relativists' *valid* criticism. Apart from the criticism of Descartes' reliance on clear and distinct ideas, mentioned in the foreword, other critics today centre on important social issues. Some of them observe that the growing relationship between science and technology obliterates the humane aim of science, and thus has a bad influence on our *desired* way of life. They accuse scientists of their preparedness to collaborate with powerful sections of society which utilize their knowledge to the detriment of society at large.⁸⁾ And other critics accuse scientists of undermining

8) This criticism is voiced mainly by post modern critics in the German-French tradition. In this book I deal mainly with authors who wrote in English simply because

traditional (moral or religious) values. This social criticism is addressed by Spinoza in his political writing, where the abuse of power is a central issue.

And third, it is also worth noting that the current view of science ignores these critics on the grounds that, being cultural phenomena, their criticism does not belong to the domains of science. This view of science, represented in this book by Feynman [discussed in chapters II and V], says that its methodological principles are exclusively derived from science itself, where ‘science itself’ means the natural sciences alone. In other words, what we call today psychology and sociology, are excluded from science. In fact, however, it is Spinoza’s approach, with his rejection of this exclusion, which can be derived from science itself. This is because, it is from these excluded branches of knowledge that he derives the necessary methodological conditions for the possible creation of all science. The mutual effects of all these branches of science is expressed in Spinoza’s proposition that the more we understand nature the more we understand ourselves, and the more we understand ourselves the more we [can] understand nature.

Before summarising Spinoza’s propositions which cannot be changed without replacing his view of nature for another, I said that, when possible, I would emphasise their interpretation in modern terms. I noted that, because this seems impossible concerning his theory of mind and political theory, I add two propositions to his philosophy of science which explain this impossibility [see p.13]. Although these additional propositions are not stated by Spinoza, they are implied by his conception of the mind and his political theory. With these two propositions I propose to show ‘the other hand’ – how it happened that the Cartesian conception of science prevented the revival of Spinoza’s philosophy outside the natural sciences. I call these propositions *The Inverted Cartesian View* and *The indirect Effect of Reason on Culture*. The former explains how the Cartesian view

of science was retained in spite of the fact that Descartes' mind/body dualism is widely rejected among scientists. I argue that this became possible by replacing this dualism with a new one, of culture versus nature. The latter reconciles Spinoza's mechanistic view of the universe with his methodological *recommendations*, a term which suggests choice, and is explained in chapters VII and XII. Together they are the topic of most chapters in the rest of this book.

Before turning to these two propositions we should note that the suspicion that our postulated scientific similarities and regularities might indicate culturally accepted conventions, rather than a *recognition* of universal properties of nature, is not an invention of cultural relativism. As pointed out in the foreword to this book, this suspicion was raised most forcefully in Hume's criticism of Descartes. And at the beginning of the 20th century, it was still found in the controversy about the reality of the atom. Participants in the Vienna Circle discussed the argument of Ernest Mach, who in the spirit of Spinoza [but without referring to him] claimed, that the fact that a postulated theoretical concept aided understanding did not imply its existence. This was a good reason for him to insist on not accepting the real existence of the unobservable atom. This example shows that what Spinoza considered to be the main advantage of his view [see p.10] became part of the scientific method which actually developed in the natural sciences. The same applies to the acceptance of the concept of a gene. The controversy about its existence stopped only when it could be shown that a sequence of nucleic-acids in the DNA performed the task assigned to it by theory. In general, scientists accepted the methodological principle that when they postulate a concept associated with a law, they must look for real mechanisms which can explain it.⁹⁾ However this could not have happened before the idea was abandoned that *all* of science could be derived from experiments alone, which is an indirect acceptance of Spinoza's version of rationalism [see pp.11-12].

9) David Marr, in his introduction to *Vision*, stated a similar idea concerning the visual system. Once we have an idea *what* the system does, he says, we can turn to find out *how* it does it.

The philosophy of science known as *physicalism* accepts the reality of all laws of nature for which observed evidence is found. But as Spinoza argues, not all philosophical principles can be proven in this way. For example, the presupposed methodological [meta-scientific] principle that *all* processes in Nature are mechanistically explicable, cannot be proved in this manner. Nevertheless, as Spinoza argued in his letter to Oldenburg concerning Boyle's experimental method [C. VI], such presuppositions are indispensable for science. And in fact, in spite of a modern reluctance to accept non-testable presuppositions, Darwin's concept of natural selection was conceived as a *mechanism* although, not only in his time but for about half a century later, nobody had any idea what such a mechanism could be, let alone how it could work. Without the conviction of most biologists, that a correct mechanism of natural selection was bound to be discovered, simply because every natural phenomenon had to be mechanistically explicable, it is doubtful that the search for it would have been sustained for so long.

The example of Darwin's theory of evolution is of particular importance for the topic of this book because the influence of Descartes' conception of science, as dealing with events in space alone, is conspicuous. Since the publication of Darwin's *Origin of the Species*, the Cartesian distinction of the mind from the body has become philosophically much harder to maintain. However, the idea that the body alone was in the realm of nature remained so deeply entrenched in the modern way of thinking that it has proved nearly impossible to eradicate. As Spinoza would probably put it, this feeling of certainty persisted in spite of the fact that the theory of evolution should have led to the recognition that the exclusion of logical thinking from human nature was mere prejudice.¹⁰⁾ However, in spite of the influence that the theory of

10) Had Spinoza's naturalism been accepted, the 'scandal of evolution' – the denial that God created all species as told in the Bible – would not have shocked anybody. Although Spinoza's philosophy is not evolutionary, there is an interesting remark concerning its possibility in the section *Of God's Power* in MT [Chapter IX, pp.126-127]. He explains that some people distinguish between things that are necessary in themselves, like mathematical theorems, and things that are necessary because they

evolution has had on the two influential philosophical ‘schools,’ positivism and pragmatism, it was the legacy of Descartes' dualism which led to what I call ‘*the inverted Cartesian view.*’

The Inverted Cartesian View.

Descartes saw in the intellect a defining property of humanity, a property which differentiated between us and the mechanically operating animals. Spinoza criticised this view when he still considered himself a Cartesian. In his MT, section *the life of God*, he traces the idea that the soul is Man’s intellectual activity to Aristotle’s distinction between the soul of man from the vegetative and sensitive souls of plants and animals respectively. Against this view Spinoza argues that if we understand plants, animals and men as operating mechanically, the postulated three types of souls, as representing three forms of life, are clearly seen as fiction. What we should understand by life, he says, is "the force through which things persevere in their own being" [MT p.120]. He explains that it is because this force can be *conceptually* distinguished from the things themselves that the idea arose that things *have* life, as if life is distinct from the living things themselves.

Clearly, an attempt to include humanity in the animal world after Darwin, should have given prominence to this view of life, and should have included reason among all the mechanisms operating in the human body, as Spinoza explains [e.g. in TCU XI]. The inclusion of reason in an explanation of life in evolutionary terms can be derived from a generalization of Spinoza’s thesis that the more one interacts with one’s environment the more mind one has. This means that the greater role of

follow God's decrees. As God's power is the power of Laws of Nature, the only meaning of attributing different decrees to God is to postulate that these laws could be different. But, if the Laws of Nature were different, the created world would be different, so that which is now true would be false. In this case, God would have given us a different intellect, and this ‘otherwise created world’ could have been understood by our different intellect. In other words, human reason would still have the function he ascribes to it, but it would have *naturally* evolved differently.

knowledge in human survival can explain the emergence of the mechanism of reason – of logical thinking – by natural selection. This is discussed in chapters IV and X. Instead, the theory of evolution centred on the evolution of the body and left thought out of consideration. This is an *inverted* Cartesian view because, although it does away with the privileged position of the existence of mankind in God's creation, it retains Descartes' claim that science can only explain the physical world. This claim does not deny that the process of thinking needs a mechanistic explanation. But the thoughts are explained as cultural products which have little to do with nature. The new privileged position of mankind is in its being guided by cultures.

A common version of this view does not reject the presupposed determinism of the mechanistic view but replaces it by cultural determinism. Thoughts are imposed on the mind through the medium of a language. To the extent that the application of reason is observed to have a real effect on people's lives, it is ascribed to the invention of a logical language. Instead of human affairs being excluded from the natural world due to the mind-body dualism, they are excluded from it due to the nature/culture dichotomy, so that human affairs are excluded from science. The objection to this determinism in the spirit of Descartes is represented in this book by William James and Noam Chomsky.

The proposition of the indirect effect of reason on culture [PIERC]

Spinoza's inclusion of the power of reason in human nature does not mean that the appeal to reason is sufficient for having an effect on a culture. This is because the mechanism of reason only allows one to accept or reject an idea in the light of related ideas, all of which are judged by a general view of the world which serves as a standard of truth, as explained in TCU VII [see p.28]. An appeal to reason may change one's understanding of a cause of any emotion, and thereby affect one's own actions. But the effect of such changes on the standard of truth is very indirect. The reason implied by Spinoza's analysis is that even when intellectuals consider, for

example, a correction of a conception of God, they consider it under the attribute of thought alone. And this can hardly have a significant influence on a predominant conception as long as there are people in their society with sufficient power to object to such a correction.

One reason for including the implication of this proposition by Spinoza's analysis in this book is that it explains why history provides evidence for both those who start with the nature/culture dichotomy and those who start with a naturalistic view as standards of truth. This is most clearly shown in chapters IX and X where I compare Dawkins' and Dennett's approach to the theory of evolution under the guidance of nature/culture dichotomy with its possible interpretation by Spinoza's naturalism. In fact, it is the possibility to interpret the evidence to support both guiding views which explain the stubbornness of their followers. What I try to show is that only Spinoza's naturalism provides a way to refute relativism. This is because if rationality is natural then it is possible to regain it, and with it to free oneself from its suppression by external influence. And if the natural function of a state is to provide peace and security, then we have a criterion for judging all cultures.

A second reason for including this implied proposition is, that Spinoza did not think that science cannot come up with answers to the traditional philosophical question "what is the best way to live?" It seems to me that it was his confidence in the future of science that led him to believe that his political theory, *might* have the same indirect effect on human life which he saw in the developing sciences of mechanics and medicine.

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In the following chapters, where I want to illustrate the influence of the Cartesian legacy on the modern approach, I choose one philosopher or scientist to represent it. Similarly, I chose one scientist, Antonio Damasio, to illustrate the revival of naturalism in neuro-science in the spirit of Spinoza.

Chapter I:

SPINOZA'S METHODOLOGICAL APPROACH

As pointed out in the introduction, Spinoza's approach is concisely explained in his essay on the correction of understanding [TCU]. In this chapter, therefore, I focus on it, although I also refer to his other books. His approach is explained in three parts:

1. Spinoza's reasons for engaging in an inquiry concerning understanding in his way.
2. On the foundations of knowledge in human nature.
3. The method.

Part 1: Spinoza's reasons for engaging in an inquiry concerning understanding in his way [sections I-III].

The personal note with which this treatise begins is characteristic of what Descartes and Spinoza called an *analytic* method, by which "one demonstrates the true means by which the matter was methodically discovered, as it were from effect to [its] cause, if the reader wishes to follow the method and to attend sufficiently to its details."¹¹⁾ This method is opposed to a *synthetic* (or geometrical) method, which is the exposition of knowledge in a logical system, starting from general laws.

Spinoza begins with saying that judging by his own experience he has reached the conclusion that things are not desired because they are judged to be good but are judged to be good because they are desired. This conclusion is the basis for many explanations in his books. In prop.XI of Part III of his *Ethics* all emotions are categorized as kinds of pleasure or pain. By his definition of the mind, the 'object' of an experienced emotion is a change in the state of the body [pp.19-20]. When such a change

11) The quotation is from Barbone and Rice's introduction to the English translation. It is taken from Ludewijk Meyer's preface to the PCP, referring to Descartes' *Reply to the Second Set of Objections* for an explanation of the analytic method. Of particular importance is to note the later change in the meaning of 'synthetic.'

increases the power of the body to act, the emotion is experienced as pleasure and is conceived as good. When a change decreases the power of action it is experienced as pain and is conceived as bad. The emotion, according to him, is a combination of this experience with the *perceived* idea of its cause, where ‘perceived’ means the experienced (rather than the understood) idea of its cause.¹²⁾ The term ‘passion’ (derived from passivity) emphasizes the involuntary aspect of emotions [E. II note to a corollary to proposition xiii].

In the first section of the TCU Spinoza explains that his preliminary analysis in this essay has been sufficient for concluding that, although the attainment of riches and fame brings pleasure to those who succeed in their pursuit, the pursuit itself has serious disadvantages. First, it always involves fear and strife, which according to his definitions are kinds of pain, and therefore experienced as bad. Second, when the pursuit is frustrated, the result is a deep disappointment, another kind of pain, which weakens the capacity to think, and in turn weakens a person's power of action [see pp.19-20 or E. III, xi]. The pursuit of fame is particularly damaging because it leads people to behave so as to please others rather than follow their own judgments.

In view of this preliminary analysis, Spinoza set himself the task of discovering by a *deliberation from within* the things that can bring the most stable happiness. ‘By deliberation from within’ he means ‘by rational analysis,’ rather than by observing the perceived causes of happiness. By

12) The examples given in the introduction, as combinations of experienced changes in the body and the perceived ideas of their causes, show that we do not necessarily perceive their true causes. It is interesting to note that this fits the modern discovery about the immune system: the experience of pain which constitutes the symptom of illness does not arise when the body is invaded by a parasite, a virus or bacteria, but when the immune system produces T-cells for fighting them. In other words, it is not the real cause of illness that we perceive [are conscious of]. The feeling of illness arises when a lot of the body's energy is diverted from regular activities to this fight. We are not conscious of the real cause of illness, but we certainly perceive it as bad, even when modern knowledge makes us aware of the useful function of this feeling. This is important for my comparison in chapter IV of the function of reason to the immune system [see p.126].

observation, he explains, he could only discover that fear, strife and disappointment occur when people fail to achieve what they desire. But more important, that the perceived causes of their desires are as variable as their circumstances of life. A stable happiness – peace of mind – can only be achieved by pursuing natural [innate] desires. This is why his ultimate aim is to discover how to strengthen the natural desires which lead to peace of mind. His desire to understand nature comes with the realization that Nature (God) is the ultimate cause of these desires, as it is of all aspects of human nature.

He explains further that, while his preliminary reflection has been sufficient for determining the topic of his research, he has realized that had he chosen to conduct this inquiry while pursuing a normal way of life, he would have been incapable of avoiding the consideration of fame and riches as *the* good offered by society. Being constantly preoccupied with acquiring them, he would have had no time left for pursuing a serious inquiry. Hence, his preliminary reflection has convinced him that, unless he took the difficult decision to lay aside the pursuit of things commonly considered good, he would fail to discover the real good he was seeking.¹³⁾

This short paragraph already justifies my interpretation of Spinoza's conception of choice as the determination to keep the mind on reason [see pp.27-28]. Yet, his mechanistic interpretation of Nature led to the mistaken idea that Spinoza denied that choice has any place in human nature. This idea is mistaken because it implies that he indulged in a pursuit of an illusory purpose, *knowing that it was an illusion*. But more important,

13) The *authenticity* of this personal account is supported by the little we know about Spinoza's life. In particular, in 1673, when he was offered a professorship in Heidelberg, he refused it. Although the offer was generous, it included a proviso that he should not attack the Protestant faith. Spinoza thanked them for the honour, but explained that the work of a philosopher, the search for truth, cannot be fulfilled under any restrictions. The *origin* of this conviction may be his doubts before turning away from his trading activities in Amsterdam toward a life of learning which, in his case, was bound to bring a loss of whatever position he had had in the Jewish community before. But for this we have no evidence.