

ΠΕΡΙΠΑΤΗΤΙΚΗ ΤΡΑΔΙΤΣΙΑ

THE PERIPATETIC TRADITION

ARISTOTLE'S VIEWS ON CHANCE AND THEIR CONTEMPORARY RELEVANCE

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ABSTRACT. In this article I first set out Aristotle's explanation of chance as a term that refers to an event that occurs unusually and that appears significant in the context of the human search to achieve a goal. On this basis Aristotle argues against Democritus that the order in the universe could not be due to chance. Aristotle argues that all natural beings strive for their full potential and greatest possible development, and this is their way of striving for the goodness of God. And they strive for survival and to remain in their best condition for as long as possible, and this is their way of striving for the eternity of God. Chance abnormalities occur accidentally in this process. This view of Aristotle enables us to give a much more satisfactory explanation of the evolution of species than that put forward by Darwin and Neodarwinians. In the field of ethics Aristotle argues that a certain measure of good fortune is required for happiness and even for the performance of virtuous acts. Finally, Aristotle rejects determinism and supports his belief in free choice by means of the reality of accidental occurrences and indeterminism in the field of physics.

KEYWORDS: Aristotle, chance, teleology, accident, freedom, determinism, evolution, soul.

In this article I shall attempt to give a brief account of some of the more important aspects of Aristotle's view of chance. I shall start with Aristotle's metaphysical account of chance, since this is where Aristotle explains the meaning of chance. I shall then move on to Aristotle's application of chance in his physics, his use of chance in his ethics, and finally his rejection of determinism, which is closely related to his account of chance. At the same time I hope that it will become clear that Aristotle's concept of chance is extremely relevant to some of the

greatest concerns of contemporary philosophers, namely the existence of God, the existence of the soul, the reality of teleology, and human freedom.

1. Aristotle's metaphysical account of chance

Aristotle's metaphysical account of chance is to be found in Book II of his *Physics*.¹ In his inquiry we find that he divides all events into three categories, namely those that occur always in the same way, those that occur usually in the same way, and those that are unusual. Thus day always follows night, summer follows winter and death follows life. There are no exceptions. However, other events occur only usually, but not always. Thus the weather (in Greece) is usually good in summer, but exceptionally there can be a storm. Finally, some events always occur unusually, such as winning a lottery or finding buried treasure. Aristotle observes, then, in the first place, that chance events always belong to the category of those events that occur unusually.²

Secondly, Aristotle observes that all events that we attribute to chance are related to our expectations and our aims in life. To clarify his meaning, we must first examine another statement of his. Aristotle says that some events occur for a purpose and others do not.³ What he means is that some events appear relevant to us and others do not.⁴ Thus when I read the newspaper I am interested in events that could have an influence on my life, and I am not interested in anything not related to my life. At all times human beings try to understand situations and events in relation to their aims. They take an interest in what is relevant and show no interest in the innumerable irrelevant details of every situation. We can compare the situation to that of an experienced chess player who will only ever examine a very limited number of possible moves, since he knows that it is pointless to examine the vast number of possible moves that will not help him to win the game.

¹ Book II of *Phys.* is largely a treatise on causes, and chance is viewed by Aristotle as a cause. His immediate reason for holding that chance is a cause (as shown by γάρ in 196 b 24) is the phrase ἀπὸ τύχης (196 b 23-24) "by chance", which implies that chance is a kind of agent.

² *Phys.* II, v, 196 b 10-13, 196 b 20; 197 a 19-20, 32; *De Cael.* I, xii, 283 a 32-283 b 1; *GC* II, vi, 333 b 3-7; *APo.* I, xxx, 87 b 19-27; *EE* VIII, ii, 1247 a 31-3; *Rhet.* I, x, 1369 a 32-b 5. Cf. *Top.* II, vi, 112 b 1-20. Cf. Freeland 1991, 56: "The key feature of the accidental is that it is not regular or predictable."

³ *Phys.* II, v, 196 b 17-18.

⁴ Cf. further Dudley 2012, 23-26.

In metaphysical terms Aristotle points out that the number of accidents or attributes of every substance or situation is unlimited.⁵ We will never take an interest in most of them.⁶ Aristotle gives the example of the coincidence that someone is cured of an illness at the time he got his hair cut, and the fact that someone is washing himself at the time that a solar eclipse occurs.⁷ One cannot say that there is any connection between these events, because one cannot lead to the other or have any relevance to it. For this reason I cannot say that I washed myself in vain because afterwards there was no eclipse of the sun. If I said such a thing I would be sent to a psychiatrist who would declare me insane, because I would not be obeying a fundamental law of human nature, which is that our intellect must always attempt to understand events, i.e. to interpret them in a way that promotes our aim in life. Thus all of the events that cannot be interpreted in terms of our goals have no meaning. But chance events belong to the small group of events that are meaningful because they are related to our aims in life, and at the same time occur unusually. Whenever something occurs unusually, and also could have occurred for a purpose, we say it occurred by chance.

Aristotle then calls chance an accidental cause and explains what he means. The fundamental cause of a house, he says, is a builder, and of a statue, the sculptor.⁸ The accidental cause of a house or of a statue is the fact that the builder or the sculptor is pale or a musician. Instead of saying that the builder built the house, I could say that a pale man or a musician built the house. But the real or efficient cause of the house is the builder. The indeterminately large number of substitute terms for the builder are accidental or coincidental causes, as they are merely accidents of the fundamental cause.

Aristotle says that chance is an accidental cause of this kind. He gives the example of a man who goes to the market-place to go to the theatre. On the way to the theatre he unexpectedly meets his debtor and gets back his debt. The fundamental cause of why the man got his money back is his decision to go to the mar-

⁵ *Met.* E(VI), ii, 1026 b 7; *Phys.* II, v, 196 b 28-29.

⁶ Cf. Charlton (1970, 106-7): "We ascribe a thing to chance only if we think it remarkable, and it is doubtful whether we should think a thing remarkable, doubtful whether we should even notice it or be able to pick it out from the rest of our environment, if it did not seem to us, at least in a weak sense, such as to be for something."

⁷ *Phys.* II, v, 197 a 21-25; II, vi, 197 b 27-29.

⁸ *Phys.* II, v, 196 b 24-27; 197 a 14-15; II, iii, 195 a 32-b 6. Aristotle calls the fundamental cause a 'per se cause' (καθ' αὐτὸ αἴτιον).

ket-place. The accidental cause is his meeting with his debtor. He sees the meeting as an accident of the fundamental cause.⁹

According to Aristotle only real existing things and human decisions have a purpose. Therefore accidents do not have a purpose. And hence accidental events do not occur for a purpose. Aristotle thus says that chance events appear to be meaningful, but in fact do not occur for a purpose. Thus the man who accidentally got his money back did not set out to get his money back, as his intention was to go to the theatre. But if he had known in advance that this debtor was coming that way, then he would have set out with the intention of getting his money back.

According to Aristotle there is nothing in the fundamental cause of a chance event that causes the chance aspect of the event. If the man had set out for the market-place to get his money back, then he would not have got it back by chance. What therefore is chance? Chance is the recognition of a meaningful event at an unexpected moment. However, this recognition depends on the continual search by our intellect for something that appears to contribute to our goal in life, since otherwise chance events would not be noticed by us. Thus the man on his way to the market-place notices the relevance of the approach of his debtor, because getting his money back will contribute to his well-being.

Aristotle wishes to explain why chance events are unpredictable. A chance event can be the outcome of innumerable fundamental causes. Thus the man who came to the market-place could have intended to go to the theatre or to meet a friend or to go to the law-court – there are innumerable possible reasons. Hence the first cause of a chance event resulting from a decision is the freedom of choice of the person whose decision is the fundamental cause. The second reason is that chance events are unusual. Hence there can be no science of chance events, as science deals with events that always or usually occur in the same way. The aim of science is to predict the future.¹⁰ But the future can only be predicted to the extent that it is possible to exclude unexpected or unusual events. Because chance events are unusual, therefore they occur unexpectedly and cannot be predicted.

We might sum up, therefore, by saying that Aristotle holds that chance is a term that refers to a particular kind of event, namely an event that occurs unusually and that appears significant in the context of the human search to achieve a

⁹ Cf. *Phys.* II, v, 196 b 33-197 a 5; 197 a 15-18; *Phys.* II, iv, 196 a 3-5.

¹⁰ The notion that science is an instrument for predicting the future is implicit e.g. in the search for the times at which honey-water is useful as a medicine, cf. *Met.* E(VI), ii, 1027 a 20-26. Cf. also *Met.* Γ(IV), v, 1010 b 11-14; *Plat. Thet.* 171e, 178 b-e. Likewise in the field of ethics, knowledge arising from experience is essential to right action: *NE* I, iii, 1094 b 27-1095 a 11.

goal. There is a fundamental cause of a chance event, but the chance aspect of the event is caused by the occurrence of an unexpected accident.

We can understand, therefore, why Aristotle so strongly opposed the philosopher Democritus, who was born about 75 years before him. Democritus maintained that the order in the universe is due to chance, but that inside the universe nothing happens by chance, because one can always find a cause for everything that happens. Aristotle replies to Democritus that this is precisely the opposite of the truth. We see very many things happening by chance inside the world. But the order in the universe could not possibly be due to chance, because there is so much regularity in this order, and anything that happens by chance takes place unusually and irregularly. For this reason Aristotle concludes that the order in the universe could not be due to chance and therefore could only be caused by God.¹¹ For Aristotle the interpretation of chance by Democritus is an abuse. Democritus, like Aristotle, was astonished at the order in the universe and found it necessary to give some account of it. But he was not willing to attribute this order to an invisible cause, and therefore, like so many contemporary philosophers, he attributed it to chance. Thus chance for Democritus is a term without content used to give an empty explanation of that which requires a real cause.¹² Thus we may say that the contemporary debate concerning the order in the universe – whether to attribute it to chance or to God – is a continuation of the debate between Aristotle's view of chance and that of Democritus.

I turn now to chance in the field of nature.

2. Chance in the field of nature

In the seventh book of his *Metaphysics* Aristotle writes that there are only three causes of everything that comes to be, namely nature, art and chance.¹³ Thus chance is one of the three fundamental causes of everything that comes to be.

However, chance is not a thing. It cannot be perceived with the senses. According to Aristotle it is a cause that accompanies the first two causes, namely nature and art. Art in this context means intellect as the source of everything that is made by human beings. Let us turn then first to chance in the field of nature.

For Aristotle nature included both living and non-living things, in fact everything except God and things made by human beings. It is unfortunate that he included non-living things as part of nature. However, Aristotle believed that non-living things belong to nature because he held that they have an internal princi-

¹¹ *Phys.* II, vi, 198 a 9-13. For Aristotle his God, the Unmoved Mover, causes the order by means of final causality. Cf. *Met.* Λ(XII), vii, 1072 b 3; *De Philos.* Fr. 21W (= Cic. *DND* II, xvi, 44).

¹² On the meaning of chance in Democritus, cf. Dudley 2012, 144-152.

¹³ *Met.* Z(VII), vii, 1032 a 12-13.

ple of movement and strive to go to their natural place.¹⁴ Thus if they are heavy, like earth and water, they strive to go down, and if they are light, like air and fire, they strive to go up. This was Aristotle's way of explaining gravity, which had not been discovered at his time. Nowadays we do not consider that non-living things strive for anything, and therefore we do not believe they have a purpose or a meaning of their own.

According to Aristotle everything in nature has a goal or aim. All living beings aim to achieve their full development and seek to remain in this condition for as long as possible. There can be no question of chance in that which occurs in accordance with nature, because something that occurs by chance does not occur regularly, whereas everything in nature occurs either always or in most cases in the same way.

Aristotle says that everything in nature comes to be by a particular kind of necessity. He distinguishes two kinds of necessity, namely absolute necessity and hypothetical necessity. Absolute necessity is found in the field of that which does not change, for example, mathematics and geometry.¹⁵ Hypothetical necessity, on the other hand, is the necessity of the means, once the aim is established.¹⁶ This is the necessity found in nature and art. Human beings first decide what they want to make, and the means are then necessary if one wishes to achieve the goal. The same necessity is found in nature, says Aristotle. From the start of the life of every living being, the goal is established. Thus in the acorn the fully developed oak-tree is potentially present and the acorn necessarily must develop into an oak-tree if nothing prevents it.¹⁷

However, nature is not intelligent. Thus a bird builds a nest and a spider makes a web without reasoning about it. But they act for a purpose and precisely as if they had an intellect. The source of purpose according to Aristotle therefore cannot be intellect. In fact purpose and goals cannot be explained in purely material terms, and the reality of aims and goals therefore shows there must be an immaterial principle, which is called the soul.

¹⁴ *Met.* Θ(IX), viii, 1050 b 22-30. *GC* II, x, 337 a 1-7; *De Cael.* IV, iii, 310 a 33 - 310 b 1. Cf. Sedley 1991, 184: "...there is no reason to doubt that Aristotle takes elemental teleology seriously..."

¹⁵ Cf. *Phys.* II, ix, 200 a 15-18; *Part. An.* I, i, 640 a 3. Cf. further Dudley 2012, 102-4.

¹⁶ *Part. An.* I, i, 639 b 23-26; *De Somn.* 455 b 26-28; *GA* V, iii, 782 a 22-24; *Part. An.* IV, ii, 677 a 15-19; *GA* IV, viii, 776 b 31-33. Cf. further Dudley 2012, 108-9.

¹⁷ Cf. Hocutt 1974, 398 who writes that Aristotle attributes to the acorn "a sort of desire to become an oak...although he does not make the mistake, of which he has often been accused, of attributing *conscious* desires to the whole of nature."

Aristotle and all ancient and mediaeval philosophers maintained that all living beings have this immaterial principle called the soul. It was Descartes, the first modern philosopher, who first held that only human beings have soul and that other living things are like machines and do not have soul. For Descartes it is the human mind that shows the reality of soul, and as other living things do not have a mind, he held that they also do not have soul. But Aristotle's view is that all living beings must have a soul, because they have a goal in life, namely that of surviving in their best possible condition, and this goal cannot be explained in material terms.

It is the aim or goal of survival that explains all of the typical characteristics of living beings, namely the fact that they feed themselves, defend themselves against predators, heal themselves when injured, develop themselves to their best possible condition, strive to stay in this condition, and finally reproduce in order to survive in the species after their death. Human beings strive for this goal with the aid of their intellect, but every other form of life strives for the same goal without the aid of intellect, and hence Aristotle concludes that the source of the goal and aim of life is not intellect, but soul.

This view of Aristotle's may be said to be of decisive importance at the present time, as it makes it clear that the materialist explanation of life is deficient. Furthermore, the materialist standpoint is weakened by the fact that scientists readily admit that they are unable to explain the origin of life, and biologists likewise admit that they are unable to explain why all living things appear to strive for the goal of survival. Biologists have invented the term teleonomy, which means that living things only appear to act for a purpose, but that the appearance is deceptive. But at the same time they continue to speak as if living beings do in fact act for a purpose. Aristotle's view is far more convincing than that of Descartes, since he argues that all living beings are endowed with soul, and not just human beings, even if the human soul is superior to that of animals and plants. Thus it is not just human beings who are different from the rest of the universe, but all of life is different in kind from inanimate matter.

Everything in nature has a goal according to Aristotle. However, nature does not always achieve its goal. There are chance substances, by which Aristotle means that that which comes to be is generated contrary to nature.¹⁸ There are two kinds,¹⁹ the first of which is where something goes wrong in nature, for example, a chicken is born with two heads, or a child is born with six fingers, or any other genetic defect. Aristotle includes the mule under this heading, since a mule is part of nature, but

¹⁸ Aristotle's detailed treatment of this topic is to be found in *GA IV*, iii-iv. Cf. also *Hist. An.* I, xvii, 496 b 17-18, *Hist. An.* V, xiv, 544 b 21, and *GA I*, xviii, 724 b 25.

¹⁹ On the second kind of chance substance, namely spontaneous generation cf. Dudley 2012, 172-190.

something has gone wrong in nature, as the mule cannot produce offspring. A cancer is another example of a mistake in nature. In the case of abnormalities in nature, it is clear that nature is aiming at a goal as usual, but that there has been an impediment and something has gone wrong. Thus the living being is part of nature, but the abnormality is contrary to nature. The mistake in nature is due to chance and can be compared to the unusual accident that causes a chance event, for example, the man who has the bad luck of meeting robbers.

Aristotle's view is that living beings are striving for the goodness and the eternity of God. They all strive for their full potential and greatest possible development, and this is their way of striving for the goodness of God. And they strive for survival and to remain in their best condition for as long as possible, and this is their way of striving for the eternity of God.²⁰ This view of Aristotle enables us to give a much more satisfactory explanation of the evolution of species than that put forward by Darwin and Neodarwinians. In order to explain why there are mutations in nature it is necessary in the first place to understand that every living being is genuinely teleologically orientated, that is to say, every living being is striving for the goal of survival. Mutations, then, which are the primary cause of evolution, occur by chance, but they are accidental to the living being which is striving for survival and perfection, and it is this kind of accident that is then selected by natural selection. Thus Darwin or Neodarwinianism is only a partial and one-sided explanation of evolution and in need of completion.

I turn now to chance in the ethics of Aristotle.

3. Chance in the ethics of Aristotle

According to Aristotle the purpose of life and of ethics is to achieve happiness.²¹ Now in order to be happy, Aristotle holds that human beings need a degree of external prosperity. Hence happiness depends to a certain extent on chance, since prosperity depends on chance. The question is, then, to what extent chance influences our happiness.

According to Aristotle happiness is not a question of having good luck, but depends on our efforts to lead a virtuous life. Virtue is therefore the source of happiness. There are two kinds of virtue, he says, intellectual virtue, which is contemplation, and moral virtue. Contemplation leads to greater happiness than

²⁰ *De An.* II, iv, 415 a 26 – 415 b 6; likewise *GA* II, i, 731 b 24 – 732 a 1. Cf. Dudley 2012, 342.

²¹ *NE* I, vii, 1097 a 34 - 1097 b 23; *EE* I, i, 1214 a 7-8. For the nuances of meaning and implications of the term εὐδαιμονία cf. Wilamowitz 1931–2, I, 369. Aristotle states that the vast majority of humanity – both the man on the street and cultivated persons – agree about this: *NE* I, iv, 1095 a 16-20.

moral virtue.²² However, the person who leads a contemplative life will also need moral virtue in order to achieve the self-control required for contemplation, and vice versa contemplation will lead people to act virtuously.²³ The person who leads a contemplative life will also act virtuously towards other people when he is not contemplating.²⁴ In the contemplative way of life, accordingly, there is a harmony between contemplation and moral virtue. Those people who do not have the education required for the contemplative life can still lead a life of moral vir-

²² *NE X*, vi, 1177 a 3-6; *NE X*, viii, 1178 b 28-30.

²³ *NE I*, v, 1096 a 4-5. The contemplative way of life (βίος θεωρητικός) includes a certain amount of moral virtue, sleep, amusements, and the other necessary actions in life, as well as contemplation as its dominant component. For a detailed account of the contemplative way of life cf. Dudley 1999, Ch. 2, Dudley 1982 and Dudley 1995, esp. 35. Cf. further Heinaman 1988, 51.

²⁴ Cf. *EE II*, i, 1219 a 35-39 and *EE II*, i, 1220 a 2-4, where Aristotle speaks of virtue of the soul as being composed of the individual virtues. Cf. *EE VIII*, iii, 1248 b 8-16, where Aristotle gives the name καλοκαγαθία to the virtue that embraces all of the virtues, and the conclusion of *EE VIII*, iii, where Aristotle emphasizes the dominance of contemplation over all other goods. Cf. von Fragstein 1974, 91. Cf. *NE I*, viii, 1098 b 15: τὰς δὲ πράξεις (reference to moral virtue) καὶ τὰς ἐνεργείας (reference to contemplation); similarly 1098 b 18-19. In *NE I*, viii, 1098 b 23-1099 a 29 Aristotle makes it very clear that moral virtue is part of the life (βίος, 1099 a 7) he seeks. Again, in *NE I*, ix, 1099 b 19-20, 31-32 there is another indication that the happiness being sought includes moral virtue. In *NE I*, x, 1100 b 9-10, where Aristotle writes that ἐνέργειαι according to virtue cause happiness, the plural indicates that he is referring to moral virtue as well as contemplation. Again, at 1100 b 19-20 he writes that the happy man πράξει καὶ θεωρήσει τὰ κατ' ἀρετῆν, a clear reference to the inclusion of moral virtue and contemplation in the contemplative life. In *NE I*, xiii Aristotle points out that, while there are two kinds of virtue, only one of them is purely rational. Moral virtue is the virtue of the irrational (not specifically human) part of the soul that is capable of obeying reason, or possibly of a second part of the rational faculty of the soul which obeys pure reason as a child obeys a father, i.e. which can only be an inferior source of happiness. Aristotle excludes as a source of happiness only the excellence of the nutritive part of the soul (1102 b 11-12) and hence includes moral virtue.

When Aristotle writes in *NE I*, ix, 1100 a 4-5 that happiness, as stated before, requires “both perfect virtue and a complete lifetime”, he must be referring back to 1098 a 16-20. But here ‘perfect virtue’ does not mean *only* contemplation, since Aristotle is speaking here of the entire contemplative way of life. The same is true of *NE I*, x, 1101 a 14-16. Purinton (1998, 273-4) holds that ‘perfect virtue’ is an abbreviation of the phrase ‘the best and most perfect virtue’. But this seems unlikely, not just because of the difference in emphasis, but because the object of the search (and thus the context) is different in the two chapters. Cf. also Cooper 1987, 197-200.

tue, he tells us. However, virtuous action does not produce as much happiness as contemplation according to Aristotle.²⁵

But apart from contemplation and moral virtue, which are the sources of happiness, the degree of happiness a person will achieve will also depend on his circumstances.²⁶ If he suffers severe disasters, then he will never be fully happy, because favourable circumstances are necessary for happiness according to Aristotle. Aristotle gives the famous example of King Priam of Troy who achieved great prosperity and great happiness, but at the end of his life his city was burned and his 50 sons and 50 daughters were killed before his eyes. Such a person cannot be said to have had a happy life, says Aristotle, because his life ended disastrously.²⁷ Hence chance plays a role in happiness because circumstances are beyond the control of human beings.²⁸ Prosperity is not a source of happiness, because an unvirtuous man can be extremely unhappy even if he is rich and has every advantage in life.²⁹ We must distinguish between a source of happiness and a condition for happiness. A source of happiness, namely intellectual or moral virtue, will necessarily cause happiness, while a condition of happiness does not cause happiness, but allows a source to cause happiness.³⁰ Thus someone who is born with more advantages in life will have greater opportunities to do good. But Aristotle points out that we must not confuse the sources and the conditions of happiness. To do so is like attributing a brilliant concert on the harp to the instrument and not to the player.³¹ A good instrument will make it possible for a player to give a better concert, but the good instrument will not help if he is not a good player, and if he is a brilliant player, he will still be able to give quite a good concert on an inferior instrument.

Some kinds of goods are useful for happiness according to Aristotle, such as friends, riches and political power.³² Other goods that are useful for happiness are

²⁵ *NE* X, viii, 1178 a 9: Δευτέρως δ' ὁ [sc. βίος] κατὰ τὴν ἄλλην ἀρετὴν [sc. εὐδαίμων].

²⁶ On degrees of happiness in Aristotle, cf. Dudley 2012, 218-9.

²⁷ *NE* I, ix, 1100 a 5-9; *NE* I, x, 1101 a 6-8.

²⁸ *NE* I, x, 1100 b 22; *NE* I, viii, 1099 b 6-8; *Pol.* VII, i, 1323 b 21-29; *EE* VI(=*NE* VII), xiii, 1153 b 21-22; *MM* II, viii, 1206 b 30-34.

²⁹ *NE* I, viii, 1099 a 31-32; *MM* II, viii, 1206 b 30-34.

³⁰ *EE* I, ii, 1214 b 24-27. Cf. *MM* I, i, 1182 a 7-9 and *Pol.* VII, i, 1323 b 26-29, where the distinction between sources and conditions is clear. It is remarkable that in *Rhet.* I, v, 1360 b 19-23 Aristotle calls the goods which he lists "parts" (μέρη) of happiness, a view which he so clearly denounces in *NE* and *EE*. Burnet 1900, 45 calls it a popular usage.

³¹ *Pol.* VII, xiii, 1332 a 25-27.

³² *NE* I, viii, 1099 b 1-2.

good health, physical strength and having opportunities in life.³³ Yet other goods are also necessary for perfect happiness, such as being born in a distinguished family, having satisfactory children, and having a pleasing appearance.³⁴ The greatest external good is honour, says Aristotle.³⁵

If we ask how much prosperity is needed for perfect happiness, we find that Aristotle replies: not too much and not too little.³⁶ Those who have an average amount of goods will be more willing to listen to reason. It is hard to be reasonable if you are too beautiful or too strong or too rich.³⁷ Too many goods are harmful or at least useless to those who possess them.

Aristotle distinguishes between goods of the soul and external goods. Goods of the soul, namely the virtues, most of all deserve to be called good and we cannot possess too many of them.³⁸ But external goods are only good for the sake of the soul.³⁹ In his *Eudemian Ethics* Aristotle makes the clear statement that the amount of goods needed for happiness is the amount that will best enable us to contemplate God.⁴⁰

The cause of external goods is chance. In the field of art a man can possess riches, friends and political power by chance, since he would normally acquire them by his skills. However, if he is born good-looking or in a noble family, that is due to chance in the field of nature, as it is pure chance and in no way influenced by our action.⁴¹

³³ *NE* X, viii, 1178 a 32-33; 1178 b 33-35.

³⁴ *NE* I, viii, 1099 b 2-3.

³⁵ *NE* IV, iii, 1123 b 17-21.

³⁶ *Pol.* IV, xi, 1295 b 3-5; *Pol.* I, viii, 1256 b 31-37; *EE* VI (= *NE* VII), xiii, 1153 b 21-24. For another argument in favour of moderate wealth, cf. *Pol.* IV, xi, 1295 b 13-21. Poverty leads to crime: cf. *Pol.* II, vi, 1265 b 12; *Pol.* II, vii, 1266 b 38-1267 a 1; *Pol.* II, ix, 1270 b 10; *Pol.* IV, viii, 1293 b 38-39.

³⁷ *Pol.* IV, xi, 1295 b 5-9.

³⁸ *NE* I, viii, 1098 b 12-15; *MM* I, iii, 1184 b 4-5; *Pol.* VII, i, 1323 b 10-11; *EE* VI (*NE* VII), xiv, 1154 a 13-14. The activity of the soul is the soul's good (*NE* I, ix, 1099 b 26-28). The activity of the soul must be a good, since Aristotle speaks of the *other* goods.

³⁹ *Pol.* VII, i, 1323 b 18-21; cf. *Pol.* I, 1253 b 31-32.

⁴⁰ *EE* VIII, iii, 1249 b 16-19. Cf. Gauthier, Jolif 1970, II, 884 *ad* 1178 b 4-5. Cf. Gigon 1969, 215: "Der Text sagt ποιήσει [1249 b 17], wobei es sich von selbst versteht, daß dieses Wort nicht gepreßt werden darf. Die richtige Auswahl der äußeren Güter wird die θεωρία natürlich nicht erzeugen, wohl aber sie ermöglichen. Ποιῆν ist nicht mehr als der Gegenbegriff zu κωλύειν (b 20). Sowohl der Überfluß wie auch der Mangel an den φύσει ἀγαθὰ können die θεωρία stören und verhindern."

⁴¹ Cf. *Rhet.* I, v, 1361 b 39-1362 a 12.

Aristotle is thus of the opinion that the perfect life depends to some extent on favourable external circumstances, and thus on chance. It may be added that the only way to eliminate chance from influencing our happiness is to adopt the view that external circumstances play no role at all in our happiness, that happiness depends exclusively on acting virtuously and having a good conscience, and therefore that we can be happy even when we are being tortured. This is the view that was adopted by the philosopher Antisthenes in the fourth century BC, by the Stoic school, and by Plotinus. The Christian view is also that it is more of a blessing to be poor than to be rich, and that one can be blessed when one is being persecuted. However, Aristotle was not willing to adopt this view and preferred to make happiness depend to some extent on possessing external prosperity, which in turn depends on chance. We may say, then, in regard to the contemporary debate, that the holy man, the man in search of the perfect way of life, may sell all his goods and give them to the poor, but that the ordinary person who strives to lead a good life will find much to agree with in Aristotle's view that a moderate amount of external goods are required for happiness.

It may be noted that chance in Aristotle's ethical works is different from chance in Aristotle's physical works. In the ethical works chance is responsible for all external goods and not just for exceptional cases. A person is born rich or poor, ugly or handsome, intelligent or stupid due to chance. Thus chance in regard to external goods in the ethical works means the random or that for which there is no explanation or just the way things are. However, external goods are merely conditions required for happiness and are not in themselves sources of happiness.

Aristotle tells us that the aim of life is happiness, and since Aristotle philosophers almost without exception have repeated the same thing, even Schopenhauer, the most pessimistic of philosophers.⁴² But if we look carefully at what Aristotle meant by happiness, we see that it is not what most people would call happiness, but rather the full development of a human being, the achievement of

⁴² For Kant's standpoint, cf. *Kritik der praktischen Vernunft* 238-9: "So fern nun Tugend und Glückseligkeit zusammen den Besitz des höchsten Guts in einer Person, hiebei aber auch Glückseligkeit, ganz genau in Proportion der Sittlichkeit (als Wert der Person und der Würdigkeit glücklich zu sein) ausgeteilt, das höchste Gut einer möglichen Welt ausmachen: so bedeutet dieses das Ganze, das vollendete Gute, worin doch Tugend immer, als Bedingung, das oberste Gut ist, weil es weiter keine Bedingung über sich hat, Glückseligkeit immer etwas, was dem, der sie besitzt, zwar angenehm, aber nicht für sich allein schlechterdings und in aller Rücksicht gut ist, sondern jederzeit das moralische gesetzmäßige Verhalten als Bedingung voraussetzt."

the greatest perfection which a person is capable of.⁴³ Thus all human beings seek to achieve their greatest degree of development and to stay in that condition for as long as possible. However, if we ask then the meaning of happiness for us, we discover that it is a feeling that we have when certain events take place, for example, if we pass an examination or become the parent of a child or have success of any kind, that is to say, it is a feeling we get when we understand that we are on the path to achieving our best possible condition. For this reason only human beings can be happy, as Aristotle points out, because only human beings have intellect and can understand that events contribute to their aim in life.⁴⁴ Animals can be contented, for example after a good dinner, but they cannot be happy.⁴⁵ Happiness, then, is a feeling and it would be strange if the aim of life was a mere feeling. Rather we should say that the aim of life is life itself in the best condition, and that happiness is a mere barometer of success in achieving this aim.

Aristotle also speaks of another kind of chance in his ethical works. Thus in his *Eudemian Ethics* Aristotle says that some people are not intelligent, but do the right thing at the right time for the right purpose.⁴⁶ According to Aristotle this leads to continual good fortune, that is to say, unexpected success in life. But these people are not really fortunate, says Aristotle, because chance or good fortune is something exceptional, whereas the source of that which occurs regularly or always in the same way is nature.⁴⁷ Thus someone who regularly has good fortune really does not have good fortune, but a good nature.⁴⁸ However, their good fortune is not due exclusively to nature. It is due to the attraction or final causality of God.⁴⁹ Thus good fortune is the side effect of the virtuous action of someone with a good nature who acts impulsively and irrationally under the influence of an intuition of the good or due to attraction by God.⁵⁰ Hence Aristotle calls it di-

⁴³ Thus Aristotle tells us that children cannot be happy, *NE* I, ix, 1100 a 1-3; *EE* II, i, 1219 b 5. Someone lacking external goods would not have had a perfectly happy life, cf. *NE* I, viii, 1099 b 2.

⁴⁴ *NE* X, viii, 1178 b 24-28; *EE* I, vii, 1217 a 26-28.

⁴⁵ *EE* I, vii, 1217 a 26-28.

⁴⁶ *EE* VIII, ii, 1247 a 13-23; 1247 b 24. Cf. Plat. *Meno* 99 c 7-9.

⁴⁷ *EE* VIII, ii, 1247 a 29-31.

⁴⁸ *EE* VIII, ii, 1247 b 18-28.

⁴⁹ *EE* VIII, ii, 20-22, 1248 a 22-29. For a detailed examination of this difficult passage, cf. Dudley 2012, 244.

⁵⁰ *EE* VIII, ii, 1248 a 15-1248 b 7 and 1247 b 33-38. Likewise *MM* II, viii, 8-9, 1207 a 35-1207 b 5. Cf. *MM* II, iii, 2, 1199 a 10-13 and *MM* I, xxxiv, 26, 1198 a 15-18.

vine good fortune.⁵¹ It is the unexpected side effect of the exercise of the virtues, which is the proper source of happiness.

We turn now to Aristotle's rejection of determinism, which is closely related to his study of chance.

4. Aristotle's rejection of determinism

In this section I shall deal firstly with Aristotle's rejection of determinism and then attempt to show the foundations of his belief in freedom. I shall argue that there are two foundations, namely the fact that the soul is a self-mover and the fact that indeterminism is a reality in the physical world.

The first reason why Aristotle rejects determinism is because of human free choice. We choose the means to our end voluntarily. Virtue and vice depend on ourselves (ἐφ' ἡμῶν), he tells us.⁵² Man is the source and begetter of his actions, as he is of his children, and the origins (ἀρχαί) of his actions are within himself.⁵³ Again, Aristotle writes in his *Eudemian Ethics*:

Hence it is clear that all actions (πράξεων) of which man is the first principle (ἀρχή) and controller (κύριος) may either happen or not happen, and that it depends on himself (ἐφ' αὐτῷ) for them to occur or not, as he controls (κύριός ἐστι) their existence or non-existence. But of things which it depends on himself (ἐφ' αὐτῷ) to do or not to do, he is himself the cause (αἴτιος), and what he is the cause (αἴτιος) of, depends on himself (ἐφ' αὐτῷ).⁵⁴

Thus it is clear that Aristotle held that human beings are free and that he rejected the notion that human beings are causally determined. Human beings must be free, he argues, because we praise and blame people and reward and punish them.⁵⁵ We do not blame and punish people if they have no choice and cannot act differently. Responsibility depends on freedom.

We can say, then, that Aristotle believed in human responsibility. However, his arguments in support of human freedom are not completely satisfactory, because they are *a priori*. He sets out from the fact that we praise and blame people and concludes that we must therefore be free. But that does not explain how man is free. The same may be said about Kant, who also held that man is free, but did not explain how this is so.

⁵¹ *EE* VIII, ii, 1248 b 4.

⁵² *NE* III, v, 1113 b 6-7.

⁵³ *NE* III, v, 1113 b 17-21; *Met.* E(VI), i, 1025 b 22-24.

⁵⁴ *EE* II, vi, 1223 a 4-9. Cf. also *GC* II, xi, 338 b 9-10.

⁵⁵ *NE* III, v, 1113 b 23-25.

We may say, then, that Aristotle in his ethical writings did not lay the foundation of freedom. But I shall attempt to show that this foundation can be found outside of his ethical writings. In order to understand why man is free for Aristotle we need to turn firstly to his *Physics*, where Aristotle points out that everything in nature has an internal principle of movement and of absence of movement, meaning that it has an internal principle of change and of retaining its identity.⁵⁶ Leaving aside Aristotle's inclusion of non-living things in his view of nature, we can say with Aristotle that living beings are not merely passive receivers of determining influences. Their specific aim or goal of survival in their best condition is not caused by any external (efficient) cause, but can only be due to an internal principle called the soul, as I have argued above. Thus the soul is a self-mover. Aristotle writes clearly in his ethical works that the first principle (ἀρχή) or source of free choice is internal, i.e. in the soul.⁵⁷ To this statement needs to be added, therefore, that the possibility of free, that is to say, uncaused, choice is related, firstly, to the fact that the soul is a self-mover. Secondly, in the case of human beings, the self-moving soul has an inbuilt faculty of intellect (νοῦς), which enables it to deliberate, to evaluate its possibilities, and to choose each time its end and the means to this end, thus to direct the self-moving soul without being determined.

Thus fundamentally, human beings are free, because they are not determined by exterior causes. They possess soul, which enables them to initiate actions themselves, and they possess intellect, which makes deliberation possible, which in turn makes possible the choice of the means to our end.

The credibility of human freedom depends, however, on a further standpoint closely related to Aristotle's investigation of chance, namely that indeterminism is a reality in the physical world. It would be surprising if human freedom were a unique exception in an otherwise determined world. Voltaire even held that it would be absurd.⁵⁸ Aristotle shows that the world is not determined from the unpredictability of the future. Everything that occurs does not happen in his opinion because of a chain of necessary causes. The chains of necessary causes are always interrupted at a certain stage by a free choice or by chance. In a famous passage in the sixth book of his *Metaphysics* he examines the case of a man who

⁵⁶ *Phys.* II, i, 192 b 13-14. Cf. also *Met.* Δ(V), iv, 1015 a 13-15.

⁵⁷ *NE* III, v, 1113 b 20-21, 1114 a 19. Cf. *EE* II, vi, 1223 a 16.

⁵⁸ Voltaire, *Le Philosophe Ignorant*, Ch. xiii, puts this view as follows: "En effet, il serait bien singulier que toute la nature, tous les astres obéissent à des lois éternelles, et qu'il y eût un petit animal haut de cinq pieds qui, au mépris de ces lois, pût agir toujours comme il lui plairait au seul gré de son caprice."

decided to eat a spicy meal.⁵⁹ As a result the man got thirsty. Therefore he decided to go out to the well. But beside the well there were robbers who murdered him. Aristotle asks the question whether the man had to be murdered and, if so, as from what point he was condemned. From Aristotle's point of view, the robbers are murderers. It is to be expected that one will be murdered if one falls into the hands of this kind of person. It is also to be expected that a man will go to the well if he gets thirsty. Of course, he would have stayed at home if he had known that the robbers were beside the well. But, as he did not know this, it would have been unthinkable for him to stay at home and suffer from thirst instead of going to the well. Hence logically he had to go to the well. It is also clear that as soon as he had eaten a spicy meal he had to be thirsty. But according to Aristotle we cannot trace the chain of causes back any further, as the man freely chose to have a spicy meal. He could have chosen to eat something different. Or possibly it was by chance that he had a spicy meal that day. Hence it is not possible to find a necessary cause why the man chose to eat spicy food or by chance had a spicy meal. The cause of the man's death was therefore his free choice to eat spicy food or the fact that by chance the spicy food was the first thing he saw when he opened his store cupboard that day. But as from the moment that the man ate the spicy food he was condemned to die.

Thus when we look back, we can say that the spicy meal on that day was fatal for the man, if we admit with Aristotle that every step in the chain of causes from that moment onwards was logical and therefore necessary. But no one can say that a man who is now in the middle of a spicy meal will be murdered because free choices and chance events can intervene at any stage.

It is striking that there is a tendency to interpret Aristotle as a determinist. This may be for ideological reasons or it may be that there is a tendency to think that man is determined by the world because the world is much bigger than man. If man were much bigger than the world, it is questionable whether there would be the same inclination to think he was determined by it. This tendency is seen in the well-known commentator D. Ross, for example, who holds that the unforeseeable is necessary, because it can be explained logically with hindsight.⁶⁰ For

⁵⁹ *Met.* E(VI), iii.

⁶⁰ Ross 1949, 77-8. Cf. also Ross 1936, 516 *ad* 196 b 10-17: "Aristotle is not claiming that there is any breach of necessity involved in such cases [sc. chance events]." Cf. Charles 1984, 47 n. 40: "Indeed Aristotle introduces such cases [sc. of chance events] to show that where there is apparently chance, there is in fact necessitation. Thus it is only *qua* seeker of W, that S's meeting T is not determined. If all that is required for the determinist thesis is that there is *some* description of the relevant processes under which the effect is determined, such cases are compatible with determinism..."

Aristotle, however, the unforeseeable is contingent, because the possibility of explanation (by means of causes) after the event does not imply necessity in advance.⁶¹ When a man decides to go to the market to attend a theatre performance, he may end up spending the day recovering a debt, because he happens to meet his debtor before reaching the theatre.⁶² There is no chain of rigorous causation leading to the event, as Ross claims. There is only a possibility of rational explanation after the event.

One might be tempted to agree with the English philosopher Hobbes that the cause of something is the combination of all the conditions that are sufficient to produce the effect.⁶³ However, it is important to recall that as long as there is no result, there cannot be a cause or set of causes. Something can always intervene to prevent an event taking place (even if this is so unlikely in some cases that one can neglect the possibility in one's calculations), and hence the anticipated cause of an event may turn out not to be a cause at all, if the event does not take place. As Aristotle points out, a sea-battle may or may not take place tomorrow.⁶⁴ A cause only becomes a cause after the event has taken place. Thus antecedent circumstances do not constitute a cause prior to the event, nor do they account for it. Again, after the event the cause given is the cause that corresponds to the explanation sought by the inquirer (or listener) at that time, and not the totality

⁶¹ Cf. *De Int.* ix, 19 a 7-19 b 4 and Dudley 2012, Ch. 1 (xi). Sorabji 1980, 32 writes aptly: "...if some of our decisions are not necessitated, it by no means follows that they are uncaused and inexplicable." Cf. *ibid.* xi: "...a cause is one of four kinds of *explanation*." *Ibid.* 40: "Aristotle's so-called four causes are best thought of as four modes of explanation..." Likewise, *ibid.* 10.

⁶² Cf. *GC* II, xi, 337 a 34-337 b 7, where Aristotle introduces a distinction between τὸ ἔσται (that which necessarily will be) and τὸ μέλλει (text Joachim)(that which is about to happen, but need not happen). He gives the example of a man who may not go for a walk, although he is now about to do so.

⁶³ *De Corpore* 9.5. Thus for Hobbes the cause of a fire is not just the lighting of a match. It is also oxygen, sulphur, dryness etc., which collectively are the cause. Hobbes is followed by Mill, *A System of Logic*...Bk. 3, Ch. V, §8, pp. 346-7: "The state of the whole universe at any instant, we believe to be the consequence of its state at the previous instant; insomuch that one who knew all the agents which exist at the present moment, their collocation in space, and all their properties, in other words, the laws of their agency, could predict the whole subsequent history of the universe..." Hobbes and Mill are followed by Sharples 1975, 269 n. 65: "But, surely, either the totality of antecedent circumstances, if they are all taken into account, does determine the result..." Likewise Ross 1936, 516 speaks of events as "necessitated by the totality of their conditions".

⁶⁴ *De Int.* ix, 19 a 30.

of antecedent circumstances.⁶⁵ Intellects are goal-orientated and therefore necessarily neglect all circumstances not relevant to their goals. Hence even if a mind could grasp the totality of antecedent circumstances of an event, it would refuse to do so due to its nature. Such a totality is, therefore, a projection of the intellect in search of a determinate explanation of what is inherently contingent.

Aristotle understood that man, in striving to stay alive (to exist and to survive) and in striving for his best condition (his best state), reorientates himself as he thinks best after every event (e.g. he recovers a debt although he had planned to go to the theatre). While man's ultimate goal – expressed in the vague and general term happiness – remains the same, the path he will take to reach it is contingent and unpredictable, because chosen freely, i.e. on the basis of personal evaluation, and because unforeseeable events (coincidences) continually influence the choiceworthiness of our course of action.

Aristotle holds the profound view that science is only of that which man notes to occur always or for the most part. There can accordingly never be a science of the coincidental, since the coincidental is the exception to the rule and therefore can never be predicted. Aristotle's view may be reformulated as follows. Science is an instrument useful to man for the achievement of his aim in life, and its usefulness is as an instrument of prediction. The reason for *explaining* coincidences with hindsight is the attempt to reduce them to a science in order to attempt (in vain) to render other coincidences predictable in the future. As prediction of the future is a major concern for man in ensuring his survival, it is most uncomfortable for man to have to face the fact that the future is inherently unpredictable.

It may be said, then, that Aristotle not only was not a determinist, but that he provided an explanation for the inadequacy of determinism. He argued profoundly not only that human free choices are not the only exception in an otherwise determined world, but that all events on earth are in the final analysis contingent, since they all go back to a contingent starting-point. This contingent starting-point can be a free choice or an accident or chance, which can be based on both. Science is only possible to the extent that accidental causes can be excluded from predictions. The scope of science is, therefore, very limited. Science is dependent on the reduction of events to fundamental or *per se* causes. Howev-

⁶⁵ Sharples (1987, 207) rightly points out: "We do not normally regard all the necessary conditions for the occurrence of an event as its 'causes', and we do not normally regard an event as insufficiently explained if we have not listed conditions which are jointly sufficient to explain why that outcome occurred rather than any other. What is acceptable as an explanation depends on the context in which an explanation is requested..."

er, *per se* causes are not sufficient to account for events. Events are, therefore, contingent.

Turning to the contemporary debate: for Aristotle it is not legitimate to view the condition of the world as the outcome of the interaction of chains of necessary causes, as many present-day scientists and philosophers would hold. For Aristotle the human intellect can only trace back one chain of causes at a time, and will always have to stop the process when it reaches a free choice or an accidental cause, both of which introduce contingency into chains of causes, since the effect of free choices and accidents on the course of events is inherently unpredictable. While the intellect is tracing one chain of causes, the outcome or final member of any other relevant chain of causes has the status of an accident in relation to the chain of causes under examination. Thus Aristotle's rejection of determinism due to unusual accidents is based on the working of the intellect in tracing individual chains of causes. We may say, then, that Aristotle's objection to the determinist standpoint, apart from the reality of human freedom, would have to be that the vision of "the world" as "the outcome of the interaction of chains of necessary causes" is an invalid mental construction, since it does not take account of accidents. The reality of accidents and of accidental causes was seen above to be fundamental to the reality of chance events.

Conclusion

Aristotle's concept of chance is without any doubt the most complex and the most profound in the whole history of philosophy. In conclusion I would like to point out that Aristotle's view of chance lies half way between that of Democritus and that of Plato. For Democritus chance is used as an explanation when in fact there is no real explanation. For Plato, on the other hand, chance is used in cases where the real cause is in fact divine providence. Aristotle is unwilling to accept these views. Instead he systematically examines the term and shows that it has unexpected and remarkable implications of the greatest importance, and it is some of these that I have tried to elucidate in this article.

REFERENCES

- Burnet, J. (1900) *The Ethics of Aristotle, Edited with an Introduction and Notes*. London: Methuen.
- Charles, D. (1984) *Aristotle's Philosophy of Action*. London: Duckworth.
- Charlton, W. (1970, reprinted with new material 1992) *Aristotle's Physics, Books I and II. Translated with Introduction and Notes*. Oxford: Clarendon Press.
- Cooper, J. M. (1987) "Contemplation and Happiness: A Reconsideration," *Synthese* 72, 187-216.
- Dudley, J. (2012) *Aristotle's Concept of Chance: Accidents, Cause, Necessity and Determinism*. New York: State University of New York Press.
- Dudley, J. (1995) "Das betrachtende Leben (bios theoretikos) bei Platon und Aristoteles: ein kritischer Ansatz," *Neue Zeitschrift für Systematische Theologie und Religions-Philosophie* 37, 20-40.
- Dudley, J. (1999) *Dio e Contemplazione in Aristotele, Il Fondamento Metafisico dell' 'Etica Nicomachea*, Introduzione di Giovanni Reale, Traduzione di Giovanni Reale con la collaborazione di Vincenzo Cicero. Milan: Vita e Pensiero.
- Dudley, J. (1982) "La contemplation (θεωρία) humaine selon Aristote," *Revue Philosophique de Louvain* 80, 387-413.
- von Fragstein, A. (1974) *Studien zur Ethik des Aristoteles*. Amsterdam: Grüner.
- Freeland, C. A. (1991) "Accidental Causes and Real Explanations," in L. Judson, ed. *Aristotle's Physics: A Collection of Essays*. Oxford: Clarendon Press, 49-72.
- Gauthier, R-A.; Jolif, J.Y. (1970²) *Aristote, L'Ethique à Nicomaque, Introduction, Traduction et Commentaire*, 4 vols. Louvain / Paris: Béatrice Nauwelaerts.
- Gigon, O. (1969) "Zwei Interpretationen zur Eudemischen Ethik des Aristoteles," *Museum Helveticum* 26, 204-16.
- Heineman, R. (1988) "Eudaimonia and Self-Sufficiency in the Nicomachean Ethics," *Phronesis* 38, 31-53.
- Hobbes, T. (1655) *De corpore*, in *The English Works of Thomas Hobbes*, vol. 1, ed. W. Molesworth. London: John Bohn, 1839.
- Hocutt, M. (1974) "Aristotle's Four Because," *Philosophy* 49, 385-399.
- Kant, I. (1975/83) *Werke, in Sechs Bänden*, ed. Wilhelm Weischedel. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Mill, J. S. (1973-4) *A System of Logic Ratiocinative and Inductive, Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation*, ed. J. M. Robson, 2 vols., Toronto: University of Toronto Press.
- Purinton, J. S. (1998) "Aristotle's Definition of Happiness (NE 1.7, 1098 a 16-18)," *Oxford Studies in Ancient Philosophy* 16, 259-297.
- Ross, W. D. (1949⁵) *Aristotle*. London: Methuen.
- Ross, W. D. (1936) *Aristotle's Physics. A Revised Text with Introduction and Commentary*. Oxford: Clarendon Press.
- Sedley, D. (1991) "Is Aristotle's Teleology Anthropocentric?" *Phronesis* 36, 179-196.
- Sharples, R. W. (1975) "Aristotelian and Stoic Conceptions of Necessity in the *De Fato* of Alexander of Aphrodisias," *Phronesis* 20, 247-274.

- Sharples, R.W. (1987) "Could Alexander (Follower of Aristotle) Have Done Better? A Response to Professor Frede and Others," *Oxford Studies in Ancient Philosophy* 5, 197-216.
- Sorabji, R. (1980) *Necessity, Cause and Blame, Perspectives on Aristotle's Theory*. New York: Cornell University Press.
- Voltaire, *Œuvres Complètes*, 13 vols. Paris, 1869.
- von Wilamowitz-Moellendorff, U. (1931-2) *Der Glaube der Hellenen*. Bd. I-II. Berlin: Weidmann.