

Chapter 3. The Ancient Greeks: a 'Case Study' in the Use of Opposition.

Any analysis of epistemological influences on values and ideas in Western societies will benefit from examination of the rich source of epistemic data provided by the writings of the Ancient Greeks. While it is true that the Ancient Greeks profoundly influenced the Western intellectual tradition, it is also true that they were a culture in many ways quite alien to our own, which nevertheless engaged in recognisably similar epistemic activities. In the writings of the Ancient Greeks, we see the beginnings of the development of contemporarily recognisable forms of systematic, publicly contestable, rationally legitimated forms of enquiry. We also see an extraordinary interest in opposition. In what follows, I will analyse some features of some significant Ancient Greek uses of opposition from an epistemological point of view. My claim is that this analysis provides important clues to general human interest in and use of opposition which are at the very least consistent with the general epistemological account that I have defended in the previous chapter.

i) Inclusiveness: a Taxonomic Strategy

Str. How true was the observation that he was a many-sided animal, and not to be caught with one hand, as they say!

Theaet. Then you must catch him with two.⁴⁸

G.E.R. Lloyd, in his book *Polarity and Analogy*⁴⁹, opens his chapter on Polarity with the remark that the 'frequency, variety and range of theories based on different sorts of opposites are well known to every student of Greek Philosophy' (p 15). Presocratic cosmological theories theorised opposites (such as hot and cold) as having originative or generative roles, or construed things as made up of mixtures of various pairs of opposites as underlying principles of matter. Their more specific theories, for example concerning the origins of the different sexes, also explained

⁴⁸Plato, *Sophist*, p 226. Jowett translation, Great Books edition.

⁴⁹Op. Cit.

such detailed phenomena oppositionally (Lloyd, pp 17-18). John Ferguson⁵⁰ describes Anaximander and Heraclitus as 'two great dialectical thinkers', and the Pythagoreans as an 'influential school of dualists' (p 11). The Hippocratic writers also gave oppositional accounts of health which referred to generative forces, or the constituents of the body, the oddness or evenness of the day of onset of the disease, seasons, wind directions, parts of the body, and so on (Lloyd, p 19 ff.). The fourth-century philosophers Plato and Aristotle are well-known for using oppositional frameworks for their theories. Plato contrasted Being and Becoming, Forms and particulars in global antitheses, and also gave oppositional accounts of causality (I will discuss this further in Part iii. of this Chapter). Aristotle, too, treated opposition as a principle of change, as a framework for the enumeration of the constituent elements of physical objects (GC 328b-330 b ff), and posited specific oppositions (notably the opposites hot/cold and wet/dry) as causal and organisational factors in particular accounts of natural phenomena (Lloyd, pp 24-26). Aristotle's attempt at an explicit, systematic account of opposition is well-known. His interest is not surprising, given that he seems to have taken opposition to be one of the basic organising principles of the world (or, as I will later argue, at least as a useful principle for building theories about the world). In *Metaphysics*, Bk X, Ch 7, 1058a,10, for example, he says 'For all things are divided by opposites...', and in Bk XI, Ch 12, 1069a, 1., he says '...all change is between opposites...'⁵¹.

The modern habit of systematic explanation is to break areas of enquiry into parts: into different disciplines, different areas of specialty within disciplines, and different problems within these areas (although a 'unified theory' of this or that remains an ideal in some quarters⁵²). Presumably a background guiding idea of the partitioning of enquiry is that different contributions can at some point be added together to produce a complete picture of the world, although in practice incommensurability of paradigms, jargon and the politics and manners of demarcation greatly hinder communication between researchers. In any case,

⁵⁰Op.cit.

⁵¹W.D. Ross (transl.), in Richard McKeon (ed.) *The Basic Works of Aristotle*, N.Y.: Random House, 1941.

⁵²Paul Davies, in *The Mind of God* (London: Penguin, 1992) describes a 'Theory of Everything' as 'a holy grail for physicists' (p 21).

present-day epistemological habits tend to make us less bothered by gaps in our understanding than might have been the case for thinkers in different cultures. In the present epistemological environment, the Ancient Greeks' attempts to map their world inclusively, to explain 'everything' by common substantive constituents and causal forces, seems quaint. It is not a reductive strategy as such that we find strange (such strategies remain a feature of the formulations of general theories today), but rather the attempt at inclusiveness, the ambition of including widely disparate kinds of thing in the explanation: numbers, human health, the weather, interpersonal relationships, the basic structure of the universe, the possibility of an afterlife.

Further, our idea of what constitutes a discrete 'part' is now largely dictated to us by highly specialised research paradigms which themselves reflect a historically evolving social and political context. We must engage with these paradigms in order to be considered legitimate researchers, and therefore to have voice in public, formally regulated forms of enquiry. The way that the Ancient Greeks partitioned off any given object of enquiry, including the picking out of relevant causal factors (e.g., the relevance of the oddness or evenness of the day of onset of illness), may seem very strange to us. It is likely that the parameters of enquiry would have been far more open in a cultural environment in which public, rationally structured, contestable forms of enquiry were just beginning to develop. However, the activity of organising and relating things together under general principles, however strange these principles may appear to us, is a recognisable epistemological practice.

Lloyd (p 91⁵³) notes that the use of 'polar' expressions occurs very early in Greek literature as a literary device. The most interesting kind of examples for our purposes involve the use of a pair of opposites to express a whole, for example where the expression 'land and sea' refers to the whole earth, e.g. in Hesiod and Homer⁵⁴. This usage reflects an important logical feature of opposition, its connexion to **inclusiveness**, to defining the **limits** or parameters enclosing an

⁵³Op. Cit.

⁵⁴See G.E.R. Lloyd, op. cit., esp. pp 91-94 for a discussion of varying uses of polar terms in pre-philosophical Greek literature. There is also a brief review of this in Ferguson, *The Opposites*, in *Apeiron*, 3, 1-12, JA 69, esp. p 1.

area of enquiry or examination. In the *Topics*⁵⁵, Aristotle claims that the 'genus containing the extremes contains the intermediates as well, as (e.g.) in the case of white and black; for colour is the genus both of these and of all the intermediate colours as well.' The idea that opposites together either **make up** or **enclose** a whole, defining the limits or parameters of the whole, is one key to understanding the Ancient Greek use of opposition.

The Pythagorean Table of Opposites, listed by Aristotle in *Metaphysics*⁵⁶ is more than inclusive; it is **exhaustive**⁵⁷ in the sense that the master opposition at its head ('limited/unlimited'), is thought to embrace everything that is. This is achieved by the use of negation: 'unlimited' is the 'term' negation of 'limited' (this will be discussed in more detail in Chapter 4.). This is an important preliminary clue that **negation** is strongly implicated both generally in the taxonomic move of partitioning a field of enquiry exhaustively, and in the use of opposites to do so. Some examples of Greek use of negation to guarantee exclusiveness in a taxonomic strategy will be discussed in Part ii) of this Chapter.

It might be thought that the construal of Greek use of opposition as reflective of their use in a taxonomic strategy is misleading, that it is more likely they thought of opposites as constitutive of reality. But as Lloyd says (p 27):

The question is...why, among the mass of data associated with such complex phenomena as diseases, *pairs of opposites* were so often singled out and assumed to be the causes at work. ...granted that many of the theories in question are connected with observed facts, others appear to be much more arbitrary, and some seem to have no foundation in experience whatsoever.

⁵⁵*Topics* Bk IV, Ch 3, approx 25-26., W.D. Ross (transl). In Aristotle I, Great Books of the Western World, Vol.8, M. Hutchins (ed.), Chicago: William Benton, (1952)

⁵⁶986a, at approximately 22-27. W.D. Ross (transl.), McKeon edition (1941).

⁵⁷'Inclusiveness' and 'exhaustiveness' describe qualities of epistemic constructs. Inclusive constructs define the perimeters of a field of enquiry but do not contain all phenomena in that field. Exhaustive constructs both define the perimeters (are inclusive) and exhaust the field. For the field of monochromatic light, the constructs black and white are inclusive but not exhaustive, the constructs black, grey and white are both inclusive and exhaustive. There are obvious connexions here with the logical concepts of contraries and contradictories, which will be discussed in more detail in Ch. 4, Part i.

Although different Ancient Greek writers may have thought that opposition was constitutive of reality, there is evidence that, at least among the medical writers, and in certainly in Aristotle, the over-enthusiastic imposition of oppositional schemas was considered misleading. A Hippocratic treatise ('On Ancient Medicine'), according to John Ferguson (p10⁵⁸) criticised the use of philosophical accounts (by, probably, Empedocles and his followers) of the medical involving the opposites hot, cold, dry and moist, **instead of basing their theories on empirical observation**. Medical views drawn from 'cosmology' were also attacked (although Hippocrates did himself cite various perceptual oppositions such as 'sweet/bitter' in his own accounts; however, he was concerned, according to Ferguson, that they be treated concretely, rather than in the abstract, as empirical causes.)

The 'method of division' described in Plato's works is dichotomously oppositional in character. It seems to have been a widely used taxonomic strategy, which seems also to have been well understood to be open to abuse. The strategy is illustrated by the following quote from *Sophist*⁵⁹, where the Eleatic Stranger says (p 221):

Then now you and I have come to an understanding not only about the name of the angler's art, but about the definition of the thing itself.. One half of all art was acquisitive - half of the acquisitive art was conquest ... half of this was hunting, and half of hunting was hunting animals, half of this was hunting water animals - of this again, the under half was fishing, half of fishing was striking, a part of striking was fishing with a barb, and one half of this again ... is the art which ... is denoted angling...

It should be clear that the recurrent 'half' in this passage is not an empirical, numerical 'half', but rather labels a division in which the two parts exhaust the genus (include everything in it) and are thought to have equal **epistemic weight**. In *Phaedrus*, Plato has Socrates describing 'two principles': the 'comprehension of scattered particulars in one idea', and the 'division into species according to the natural formation, where the joint is'. He describes the process of division, using as an example 'the body which from being one becomes double and may be divided

⁵⁸Op. Cit.

⁵⁹Op.Cit.

into a left side and a right side, each having parts right and left of the same name,' and remarks 'I am myself a great lover of these processes of division and generalization; they help me to speak and to think'; he then attributes this practice to dialecticians, rhetoricians and those who 'impart their skill to any who is willing to make kings of them and to bring gifts to them' (*Phaedrus*, p 266⁶⁰). Socrates is here satirising the overenthusiastic and disingenuous enthusiasm for dichotomous division among the professional debaters of his time. This kind of enthusiasm for, and abuse of, dichotomous division, however, would not have been prevalent unless dichotomous division was persuasive, and this requires an epistemological explanation.

Aristotle also explicitly rejects the dogmatic use of bifurcate divisions in *Parts of Animals*, Bk I, ch 3. 643a : '...a privative⁶¹ term, being insusceptible of differentiation, cannot be a generic differentia.' A privative term is not itself 'subdivisible' (642b). Further:

...we cannot get at the ultimate specific forms of the animal, or any other, kingdom by bifurcate division. If we could, the number of ultimate differentiae...will be four or some other power of two... (as will be) the number of the ultimate species comprehended in the order. (643a⁶²).

In *Posterior Analytics*, he describes the method of division as involving assumption rather than being a process of inference, and observes that it 'demonstrates as little as does induction'⁶³. However, 'if it gives knowledge, it gives it in another way ...induction is not demonstration any more than is division, yet it does make evident some truth.'⁶⁴ Where Aristotle defends the use of opposition as an explanatory framework, then, he may well be treating it as an *a priori* epistemic strategy designed to guarantee **inclusiveness, or exhaustiveness**. Hence he

⁶⁰*Phaedrus*, Benjamin Jowett (transl.), in *Plato*, Great Books of the Western World, Vol. 7, R.M. Hutchins (ed.), Chicago: William Benton, 1952.

⁶¹A 'privative' term is the term for the lack of an attribute in a thing which should have it, e.g., 'blind' is the privative of 'sight'. See Aristotle, *Categories*, Ch 10, 12 a 25 ff. for his discussion of privative opposition. His account of privatives is discussed further in my Chapter 4, Section iii.

⁶²William Ogle (transl.). In McKeon, op. cit.

⁶³Bk II, Ch 5 1-15, G.R.G. Mure (transl.), in McKeon, op. cit..

⁶⁴Op. cit., approx. 32-34.

says, in the *Posterior Analytics*, Bk II, Ch 13, 96b, 35: '...division is the only possible method of avoiding the omission of any element of the essential nature.' At 97a, 5-10 he says: 'To define and divide one need not know the whole of existence..' (and a little later, 10-25):

...when one has taken one's differing pair of opposites and assumed that the two sides exhaust the genus, and that the subject one seeks to define is present in one or other of them, and one has further verified its presence in one of them; then it does not matter whether or not one knows all the other subjects of which the differentiae are also predicated....to postulate that the division exhausts the genus is not illegitimate if the opposites exclude a middle; since if it is the differentia of that genus, anything contained in the genus must lie on one of the two sides.⁶⁵

In *Topics*, Bk VI, Ch 9, 147a,⁶⁶ Aristotle says:

...in defining knowledge, a man in a sense defines ignorance as well, and likewise also what has knowledge and what lacks it, and what it is to know and to be ignorant. For if the first be made clear, the others become in a certain sense clear as well. We have, then, to be on our guard in all such cases against discrepancy, using **the elementary principles drawn from consideration of contraries and of coordinates** (my emphasis).

The central point here is the mutual semantic dependence of contraries, and his reference to **coordinates** in the context of remarking upon this. In this passage he is explaining that 'contraries' (knowledge/ignorance) are supposed to divide up (coordinate) the field of objects to which they apply, in **tandem** with each other, that is, not overlapping or conflicting, and yet sharing a common semantic content.

Aristotle says of contraries that they apply to (among other things) 'the most different of the attributes in the same recipient subject,...to the most different of the things that fall under the same faculty, ... to the things whose difference is greatest either absolutely or in genus or in species' (*Metaphysics*, Bk V, Ch 10, 1018a, 25-

⁶⁵Op. Cit.

⁶⁶*Topics*, op. cit.

35⁶⁷). The use of the term 'absolutely' here stands in for what is otherwise explicitly given content (in phrases such as 'same recipient subject', 'same faculty', 'in genus', 'in species') as necessary to the concept of extremities of difference: a limit that gives sense to the notion of extremity. This limit is the horizon of application of the pair of contraries, the field in which they apply. My point here is that while contraries need not be themselves exhaustive of an epistemic field⁶⁸, they indicate limits by marking the **horizon** of that field, just as, for example, North and South are 'located', as reference points, on the horizon of the spatial field to be mapped. **This can be thought of as an epistemic strategy of maximising enclosure in a field of enquiry.** Further, when an additional set of opposites is used to extend the mapping of a field to two dimensions (e.g., the addition of West and East as coordinates of a space), they are placed at maximal distance from the other set of opposites (at 'right angles' to it). Again, this equally maximises the epistemic enclosure within the field for each segment defined by the two dimensions of opposition (e.g., 'North and West' and 'North and East' enclose equal areas of the field). Such coordinates also place categories of objects within that field into epistemic articulation with each other, coordinating categories of objects in that field. Just as the directions North/South and East/West provide us with coordinates by which we can place objects in spatial relation to each other, the properties, 'hot and cold', for example, can provide coordinates with reference to which salient characteristics of a whole array of objects can be used to place them systematically in conceptual relation to each other.

The Ancient Greeks' widespread and varied use of opposition in their theories must reflect a view about **theories**: that they should identify and relate opposites which define the parameters of the object of enquiry and hence are **inclusive**, and which **order** the identified parts of the object of enquiry into systematic relations with each other. Kant in the *Transcendental Analytic*, Bk I, Ch I, Sect 3, B110⁶⁹ says: '...all *a priori* division of concepts must be by dichotomy'. The use of dichotomous divisions (which, I earlier argued constitute the simplest form of opposition) makes

⁶⁷Op. Cit.

⁶⁸As I earlier argued, oppositional contraries are always constructed from an exhaustive division of an epistemic field.

⁶⁹Immanuel Kant's Critique of Pure Reason, Norman Kemp Smith (transl.) London: Macmillan (1986), p 116.

sense if viewed as an *a priori* epistemic strategy, not as reflective or even anticipatory of dichotomous divisions in nature. Opposites are closely involved with simple organisational demarcations and partitions of a field of enquiry.

ii) Mutual Exclusiveness and Negation.

In discussing 'polar' expressions, Lloyd (p 91-2⁷⁰) notes a second kind of example occurring in early Greek literature. This involves the use of pairs of opposites to isolate or highlight one of a pair of alternatives across a significant distinction, as in 'are you on public, or on private, business?'⁷¹. This usage reflects a second important logical feature of opposition: **mutual exclusiveness**.

Lloyd remarks that the two assumptions of exhaustiveness and mutual exclusivity tend to follow upon any classification of phenomena 'as a whole' into two groups (p 94). This recalls my earlier arguments that unity and exhaustiveness, and diversity and mutual exclusivity, are jointly functional dimensions of any taxonomic activity, which are respectively expressed in the semantics of the spotlight and toggle negations which are used to structure epistemic fields. He continues that it later became a common style of argument among Greek philosophers to try to construct a forced choice between two alternatives, which were treated as if they were mutually exclusive and exhaustive. Parmenides exemplifies this style of argument, frequently, according to Lloyd (p 104), inflating an 'is/is not' contrast to a 'necessarily is/necessarily is not' contrast in order to force an issue. Lloyd says (p 106):

...Parmenides uses what might almost be called a principle of Unqualified Exclusion: either 'it is'(and this is taken in the sense of necessary and unalterable existence) or 'it is not at all' (it is inconceivable).

The point here is that the construction of a forced choice between two alternatives is the construction or positing of a framework in which a choice must be made, that is, a framework of mutually exclusive and exhaustive options. This enables the

⁷⁰Op. Cit.

⁷¹Lloyd cites this to Od. 4 314.

choice of one option to preclude the choice of the other, and the rejection of one option to force the choice of the other. If the forced choice is between two propositions, they must be framed so that they are mutually contradictory. Mutually contradictory propositions feature in Aristotle's account of opposition as one important kind of opposite⁷². He explored the issue of the relationships between affirmative and negative propositions, on the one hand, and of the affirmations and negations they might contain, on the other; this exploration is closely connected with his 'Square of Opposition', which will be discussed in detail in Chapter 4., Part i). Affirmation and negation, then, appear to be deeply implicated both in mutual exclusivity and in opposition in general. What more might be involved?

It is interesting that Parmenides tries to achieve both mutual exclusivity and exhaustiveness via a **modality** inflation and (according to Lloyd) a **quantity** inflation⁷³. In the previous chapter I will mentioned some modal and quantificational implications of mutual exclusivity and exhaustiveness. In Chapter 4. I will show how these are involved in the construction of polar oppositions between comparatives; this is central to understanding the good/bad value opposition.

In the *Posterior Analytics*, Aristotle says that a demonstrative proposition 'lays down one part to the definite exclusion of the other because that part is true'. He goes on: 'A contradiction is an opposition which of its own nature excludes a middle.'⁷⁴ It is important not to confuse the logical possibility of a 'middle' with the mutual exclusiveness characteristic of oppositionality. The trinarism good/indifferent/bad (a trichotomous scalar opposition, where good and bad are polar scalar opposites) is an example of an oppositional pair with a middle category. **The three categories are each mutually exclusive**, are each other's 'contraries' with respect to the scale that they exhaust. However, at a meta-epistemic level, this must be cashed out as the claim that to attribute more than one of these categories as a predicate to the same thing (in the same respect, etc.) involves one in a

⁷²See, for example, *Categories*, Ch 10, esp. 13b. E.M. Edghill (transl.) in McKeon, op. cit.

⁷³Lloyd cites Parmenides' use of 'wholly' in an argument in Fragment 8 of the Way of Truth: 'thus it needs must be either that it is wholly or that it is not'. (p. 105 of Lloyd). 'Wholly' here seems to be a **quantificational** operator on the subject of the is/is not predicate, paraphrasable as 'all of it is, or all of it is not'.

⁷⁴Op. Cit., 72a, 10-15.

contradiction. This connexion between the 'missing middle' of contradiction and the mutual exclusiveness characteristic of oppositionality is, therefore, an **indirect** one. Writers on the ideological abuse of dichotomous division can be confused by this, arguing, for example, that we should deal with the problem by finding some third, 'middle' way, or blaming the Law of Excluded Middle for the tendency to binaristic thinking⁷⁵. However, the avoidance of contradiction is a core (if defeasible) guiding principle of classification. The construction of mutually exclusive and exhaustive categories generates a forced choice by trading on the principle of non-contradiction, not by virtue of using only two such categories. The reason for the prevalence of dichotomies in this style of argument has to do with the simplicity of their structure, something which should be evident from the discussion in the previous chapter.

The role of 'intermediaries' is discussed by Aristotle in various places, most clearly where he gives an account of the different kinds of opposition (e.g., in *Categories*, Ch 10.) In *Topics*, Bk IV, Ch 3, 123b ff, when discussing the rules governing contrary categories of genus and species, he mentions intermediaries which are 'mere negations of the extremes' by contrast with intermediaries which count as 'a subject' (approx 19-20). The intermediaries between virtue and vice and justice and injustice are 'mere negations', but the intermediaries between black and white (the colours) count as 'a subject'. Although I think his examples are misguided, the general thrust of this distinction has affinities with the distinction I have made between a spotlight negation, which cannot take a predicate (be a 'subject') and comparative or toggle negation which is epistemically positive and so can take a predicate. The similarity is more apparent in his remarks on the difference between negation and privation. In *Metaphysics*, Bk IV, Ch 2, 1004a⁷⁶, of negation Aristotle says: we ... say simply that that thing is not present', and of privation he says the thing 'is not present in some particular class ... difference is present over and above what is implied in negation; for negation means just the absence of the thing in question, while in privation there is also employed an underlying nature of which the privation is asserted'. Thus in privation, the 'lack' has a positive quality

⁷⁵An example is Nancy Jay, 1981, Gender and Dichotomy. *Feminist Studies*, 7, No. 1, Spring, pp 38-56.

⁷⁶W.D. Ross (transl.), McKeon, op. cit.

provided by the underlying 'nature' which should have, but lacks the thing, while negation as such need not have this quality.

For the present, it is sufficient to note that Aristotle makes a clear connexion between 'intermediaries' and negations. a connexion which, if opposites are considered inclusive within a kind or genus, implies that intermediaries are also 'contraries' and which, in conjunction with the mutual exclusiveness of opposites, strongly implicates negation in oppositional categorisation.

Many explicit remarks about opposition that emphasise mutual exclusivity occur in Plato. In the *Phaedo*, for example: '...not only do essential opposites exclude one another, but also concrete things which, although not in themselves opposed, contain opposites...' (*Phaedo*, p104⁷⁷) And later, (p 105) he concludes that 'not only opposites will not receive opposites, but also ... nothing which brings the opposite will admit the opposite of that which it brings, in that to which it is brought.' The famous first known formulation of the Law of Contradiction, that 'The same thing clearly cannot act or be acted upon in the same part or in relation to the same thing at the same time in contrary ways', occurs in *The Republic*⁷⁸, as part of an argument that reason and desire are radically different and opposed parts of the soul.

While some kinds of opposites are more overtly linked to negations than others, it seems clear that negation and mutual exclusivity were recognised by the Ancient Greek philosophers to be centrally involved in opposition.

iii) Causation and Comparatives

Lloyd remarks (p 27⁷⁹) 'The question ...is why, among the mass of data associated with such complex phenomena as diseases, *pairs of opposites* were so often singled out and assumed to be the causes at work.' Commentators frequently cite the alternations of the seasons and seasonal changes in the environment as a

⁷⁷Benjamin Jowett (transl.), *Plato*, op. cit., p 244.

⁷⁸*Republic*, Bk V, p 436b, Benjamin Jowett (transl.), *Plato*, op. cit., p 350.

⁷⁹Op. Cit.

major stimulus for cyclical oppositional accounts of change and permanence. In discussing J. Burnet's⁸⁰ environmental account of the Greeks' use of opposition Lloyd quotes him in part as follows⁸¹ :

The changes of the seasons are plainly brought about by the encroachment of one pair of opposites, the cold and the wet, on the other pair, the hot and the dry, which in their turn encroach on the other pair.

If, with Kant, and also with Hume, we think that observation of consistent temporal priority is closely linked to our perception of a cause as a cause, then the alternating temporal sequences of the oppositions of nature in the seasons would provide vivid stimuli for the forming of an associative link between the alternation of opposites and diachronic causal relationships between them, especially those proceeding through intermediate stages. Shortly I will discuss other salient stimuli for this. Ferguson, who portrays Anaximander as the first philosopher to explicitly use an oppositional explanatory framework, has this to say about his cosmogony:

There is a continual process of coming to be and passing away, emergence out of the hot and cold substances and resolution into them again ... Winter follows summer, summer follows winter; day follows night, night follows day; drought follows flood, flood follows drought. Yet the cycle is governed by law; neither the hot substance nor the cold has the ultimate power, but the Undefined ... I can see clear evidence that if (Anaximander) did lengthen his oppositions beyond (hot and cold) he did not confine them to two pairs but used opposition as a **general principle of interpretation**. (my emphasis, p 3, op. cit.).

In the *Phaedo*, Plato has Socrates arguing, in the course of defending the view that there is an afterlife, that it is a general principle of change ('becoming') that 'all things which have opposites (are) generated out of their opposites' (70 d⁸²). His argument goes on: 'anything which becomes greater must become greater after being less... And that which becomes less must have been once greater and then have become less...' (70 d). Then comes a switch from these tautological

⁸⁰Early Greek Philosophy, 4th ed., London: 1948.

⁸¹Pp 8f of Burnet, p 28 of Lloyd.

⁸²*Phaedo*, op. cit.

diachronic comparative claims to the following 'generative' quasi- or proto-causal claims (71 a): 'And the weaker is generated from the stronger, and the swifter from the slower.' Then we get the placement of these comparatives within a 'process' framework (71a): 'And in this universal opposition of all things, are there not also two intermediate processes which are ever going on, from one to the other opposite, and back again; where there is a greater and a less there is also an intermediate process of increase and diminution...?' Finally, we arrive at explicit mention of causal processes: 'And there are many other processes, such as ... cooling and heating, which equally involve a passage into and out of one another. And this necessarily holds of all opposites...' (71b).

The course of this argument illustrates very well the process of association by which opposites may have become construed as mutually causal. The chain of associations begins with the singling out of comparative relations between different states of an enduring object which also coincide with a diachronic relationship between those states (e.g., *larger than* coinciding with *later than* in 'becoming greater'). These relations occur between temporal stages of the one object, so the only relevant differences between the two comparands are their relative sizes and their temporal locations. A simple principle that temporal priority and causation are linked, therefore, will give the 'flavour' of causation or generation of the later state by the earlier state. But this does not apply to 'the weaker' and 'the stronger', or 'the swifter' and 'the slower' **in general** (strength is not always followed by weakness, and strong things are not always found temporally prior to weak things), because these comparisons do not necessarily involve different temporal stages of the one enduring object. Rather, the flavour of causality appears here to have been 'passed across' from one set of relations to the other via the mere presence of comparative relationships, such as 'greater than', 'stronger than', and 'swifter than'.

The key to understanding how this chain of association for opposition and causality begins is the recognition that comparative judgements, and the transitive, asymmetrical ordered series that they can generate, are implicated in one very important kind of opposition: scalar opposition.

A good thing is *better than* a bad thing, when the things are evaluated in the same respects. A black thing is *darker than* a white thing, a loud thing is *louder than* a soft thing (again, when judged in the same context, by the same person), and so on. For one very important kind of opposite, the attribution of opposite predicates directly implies corresponding comparative predicates. The relationship between categorical oppositional terms and the comparatives semantically and logically connected with them has inspired a large body of research on the direction of logical priority, or the direction of psychological or developmental priority, between the categorical and the comparative forms⁸³. Sapir (1963⁸⁴), for example, says:

It is very important to realize that psychologically all comparatives are primary in relation to their corresponding absolutes ("positives"). (p 125)

However,

Linguistic usage tends to start from the graded concept, e.g. good..., for the obvious reason that in experience, it is the strikingly high-graded or low-graded concept that has significance, while the generalized concept which includes all the members of a graded series is arrived at by a gradual process of striking the balance between these graded terms. **The purely logical, the psychological, and the linguistic orders of primacy, therefore, do not necessarily correspond.** (p 125, my emphasis).

If, however, as I have argued, dichotomous and polar scalar opposites (like pass/fail and good/bad) are merely less finely-grained constructions reiterating the relations between adjacent points on a scale, (which stand to the latter like fractals), then this issue is misleadingly drawn, as the categorical oppositional pair are **global relata** of a less finely-grained construction of the comparative⁸⁵.

⁸³Notably in the fields of semantics, linguistics and axiology (see Bibliography under Part II for examples).

⁸⁴Edward Sapir (1963), *Grading: A Study in Semantics*, *Selected Writings of Edward Sapir in Language, Culture and Personality*, David G. Mandelbaum (ed.), Berkeley: University of California Press.

⁸⁵And hence it is not surprising that, for example, children proceed from facility with the global comparative to facility with finer comparative distinctions (e.g., tend to use good/bad contrasts before they use finer '*better than*' comparisons). Similarly, C. Goddard and A. Wierzbicka (1994) argue that 'good' and 'bad' are lexical primitives found in every language, making no such claim for 'better than'.

For scalar opposites, exemplified by such opposites as past/future, black/white, loud/soft, day/night, North/South, and significantly, good/bad, the comparative judgements they imply (e.g., the past is earlier than the future, black is darker than white) are of the kind that can generate (or are implicitly based upon) ordered series of (epistemic) objects in reiterated transitive, asymmetrical relations.

The recurrent cycles of the seasons and other environmental oppositions like day and night, morning and afternoon, sunrise and sunset, provide a vivid environmental stimulus not just for oppositional taxonomic strategies, but for those utilising oppositions occurring in certain temporal relationships with each other. The passage of time is a formal feature of experience that we structure transitively (if C is later than B, and B is later than A, then C is later than A) and asymmetrically (if B is later than A, then A is neither simultaneous with, nor later than B). The environmental cycles are **diachronically ordered**, as well as exhibiting other ordering relations. The seasons salient to the Ancient Greeks were ordered not only in time, but by salient environmental properties like *hotter than* and *drier than*. The day/night opposition includes a *darker than* relationship between the two⁸⁶. Morning and afternoon can be distinguished by the comparative spatial positions of the sun, as can sunrise and sunset. Of course, there is more to each of these oppositions than this, but they at least exhibit the coincidence of salient comparative relations with diachronic relations.

Now one more thing has to be noted about comparative judgements before I can make my point about the Greeks' construal of opposites as mutually causal. This point is that comparative relations, even when asymmetrical, are in a sense **invertible**. The relation described from the point of view of one of the comparands is the inverse of the relation described from the point of view of the other comparand. If one thing is larger than another thing, then the latter thing is smaller than the former, and in the same degree that the former is larger. The **one**

See *Introducing Lexical Primitives*, in *Semantic and Lexical Universals*, C. Goddard and A. Wierzbicka (eds), Philadelphia: John Benjamins Publishing Company.

⁸⁶It also includes a presence/absence (of the sun) contrast, a fact that is significant to understanding how oppositional comparative categories are constructed from ordered series of transitively comparatively related objects. This is explained in Chapter 4, Section iv, and will be closely examined in Part II with reference to value opposition.

relation has two aspects, corresponding to the two perspectives (the two objects related) from which it can be described. Viewed purely as a relation, 'larger than' is the **same** relation as 'smaller than'. Since comparative relations are invertible, a diachronic sequence of events coinciding with the relation *hotter than* (things becoming steadily hotter), followed by a diachronic sequence coinciding with *colder than* (then becoming steadily colder) can be viewed as a **recurrence** of the **same** relation, albeit inverted. Further, the sameness of the relation would be epistemically emphasised by the underlying sameness (of duration) of the diachronic relation.

If in our experience a hot/cold sequence were followed by a wet/dry sequence, then by a dark/light sequence, then perhaps by a wet/dry sequence again, and so on, we could still identify a recurrent pattern - that of recurrent episodes of gradual movement through various ordered series. The simple coincidence of **comparative relations**, arranged in ordered series, originating and terminating at extremes, **with consistent diachronic relations**, could easily facilitate the construal of comparative relations, as such, as causal. But salient features of our experience are even more satisfyingly consistent than this. For many salient environmental patterns of change, such as climate, the phases of the moon, and so on, a transition through an ordered series, say of temperature, continues steadily until some point, stops, and then begins again, moving in the opposite direction, but in the same comparative relation. It is the sameness of the comparative relation which underpins the identification of a hot/cold sequence with a cold/hot sequence in the same causal relation, as part of the same causal flow. The Greeks' construal of opposition as causal arises from the epistemic identification of comparative relations, temporal relations and causality.

Hume argued that the identification of constant conjunctions is the identification of causation; Kant, apparently in response, argued that perception of constant conjunctions as causal is part of a much more constructive and active process of imposing (diachronic) order on experience through the application of the synthetic *a priori* principle that all events stand in causal relations to other events. Wherever we stand, epistemologically, on the spectrum from passive observation to active *a priori*, however, the recognition and manipulation of recurrent specific sequences of events is clearly closely tied up with our recognition and manipulation of causation.

Whether or not we think there is more to a cause-effect relationship than the constant conjunction, these are at least strongly implicated in the identification of causal relationships. The recognition of recurrent sequences of comparative relations, underpinned by consistent diachronic relations, is the recognition of a constant conjunction, of a recurrence of diachronically contiguous sequences. This, I would argue, is the source of the Ancient Greeks' association of opposition with causality.

I have argued that the Ancient Greeks construed opposites as causal because these oppositions' underlying logical structure (comparative scales) coincided with the logical structure of changes occurring over time in their environment. Salient sequences of change in their environment were unified by consistent underlying comparative relations which are logically invertible, facilitating the construal of their extremities as pairs of consistently alternating causes and effects. My final suggestion is that the notion of the symmetry of oppositional causal forces, and of **balance** as a telos or goal of causal forces, is a natural consequence of this chain of associations between opposition, comparatives and causality.

Ferguson goes on from the remarks quoted above to explain that Anaximander's philosophy was one of 'balance', and that Heraclitus held the view that permanence resulted from a balance of opposites (p 4.). This was a view that probably heavily influenced the later medical writers. Alcmaeon, who wrote contemporarily with Pythagoreans and was influenced by them, nevertheless rejected the Pythagorean view that opposition is asymmetrical⁸⁷ and held that health arose from a **balance** of opposite powers (or capacities or qualities), for example of moist, dry, bitter, sweet (op. cit., p 5). Various other philosophers, for example Archelaus, according to Ferguson, gave mixtures of opposites (such as hot and cold) causal significance (such as contribution to the causing of life) in their systems (p 9). The medical writers of around the late 5th century BC used a term for the opposites which meant 'something which has an effect' (p 11, op. cit.). Here the idea of the relations between oppositions of substance, quality and environment, and in particular the notion of **excess** in one or the other member of a pair of opposites, consistently

⁸⁷'(O)ne list was good and the other bad', Ferguson, op. cit., p 5. I will be discussing the Pythagorean and other asymmetrical oppositional taxonomies in Section iv of this Chapter, and in detail in Part III of this thesis.

plays a significant part in theories of diagnosis and cure; this has obvious links to the concept of balance (Ferguson, p 10 11. See also Lloyd, pp19 ff).

The invertibility of scales of comparison, combined with the empirical experience of apparent alternating cause and effect roles for their extremes, would suggest to the Ancient Greek thinker that the causal force discerned in the cycle of opposites lay not in any special characteristics of one or the other member of a pair (such as hot and cold), but in the oppositionality, as such, of the pair. Ferguson's remark about Anaximander (quoted above) that '...the cycle is governed by law; neither the hot substance nor the cold has the ultimate power, but the Undefined' can be interpreted as an example of just this kind of conclusion. The general perception of the alternating sequences of causation as occurring over similar periods of time would ground an inference that the causal forces involved were of similar strength, no matter which opposite was now in the causal ascendant.

The notion of 'balance' is readily and necessarily acquired for animals whose movement relies upon it. In Chapter 1, Section ii), I reviewed Mark Johnson's argument that 'balance' as an epistemic organising principle may be psychologically grounded in our bodily experiences, for example, toddlers' early attempts to sit and walk⁸⁸. But in addition, there would obviously be many everyday experiences, including experiences of personal combat, which would ground an association between the conjunction of equal but opposite forces with stasis, balance or equilibrium. If this stasis is conceptualised as good (that is, if some continued, unchanging state of affairs, is construed as a goal of the system), then this good may be thought of as achievable through a balance of opposed forces.

This is just how thinkers unacquainted with more complex conceptualisations of systems might view human and animal health. Functionalism is a teleological theoretical framework for explanation that is most at home in the world of organic life. 'Life' is the guiding value which both explains each element of the causal system in an organism and underpins the 'gestalt' effect of the cooperative relations between these elements. It makes sense of, gives a point to, the various events that occur in the system. The value of life is readily extended both to its emergence and

⁸⁸See especially pp 74ff, *op. cit.*

continuation, although this is often understood confusedly and is extremely vulnerable to ideological manipulation. However, the central point is that 'life' as a telos for a living organism amounts to the **continued** functioning of the system, and that the related value concept of 'health' can be interpreted as the continuation of the capacity of the system to engage in activities that it has previously been able to engage in⁸⁹. If viewed this way, health can be viewed as a kind of stasis or equilibrium, in that what is desired for the organism is an unchanged state - the continuation of its capacities, or the return to a previous state, the restoration of previous capacities. Given the associations between the balancing of opposed and equal forces and stasis, and the desire that a system continue as before, or be restored to a previous state, the idea that health amounts to a balance of opposed forces is understandable.

The connexion between the causality of opposites and the optimality of balance, although by no means universal in Ancient Greek thought, nevertheless constantly recurs and is especially evident in the medical writings. Ferguson notes (p12, op. cit.) that Aristotle's father was a doctor, connecting this fact with Aristotle's use of the four opposites (the hot, the cold, the wet and the dry) that were prominent in medical theory. But perhaps a more general connexion can be made. Both the use of opposition as a framework for organising empirical accounts of causation, or of guiding principles of action, and the notion of balance as optimal, are important to Aristotle's ethical theory as well as his medical accounts. My claim is that this arises as much from logical features of opposition, and from the epistemological strategies in which opposition was employed, as from environmental and other accidental contexts of Ancient Greek thought.

⁸⁹'Health' is a heavily value-laden concept and the notion of sustaining previous levels of capacity would be only one criterion for its application. Other criteria would arise from the capacities exhibited by other things of the same kind, and some would arise from the dominant values of the particular society. For example, the capacity to excel at certain idiosyncratic physical activities (e.g., football) that are valued by power groups in a particular society might influence standards of physical excellence and thence of health in that society. There is also the concept of 'flourishing', which can be crudely linked to **growth**, for example in economic theory. 'Flourishing' relies on the idea of enhancing capacities, rather than maintaining them, and while it may seem to presuppose a (positive) imbalance of forces, it can nevertheless be construed as sometimes presupposing some balanced **context**, as where we might suggest that a balance of biological forces in an ecosystem maximises individual flourishing in that system. Here what we might want to say is that it is an appropriate telos for the ecosystem that there be a balance of flourishing.

It is clear that much Ancient Greek use of opposition can be understood as a mapping strategy for understanding the world as a whole, or for mapping any given field of enquiry. The opposites are used as navigation-points that mark both the horizons of enquiry, and provide a grid by reference to which the disparate objects and events in the world can be ordered and arranged. It is important to recognise that causation is also an object of enquiry, and that the recognition and placement of general cause-effect relationships in the system is also a taxonomic activity. The popular Western concept of causation is diachronic and 'linear', although all causal analysis must deal in some way with contextual, and hence contemporaneous, influences on observed patterns of events. This concept has probably arisen from the popular conception of the practice of laboratory science as the isolation of a designated independent variable in a temporally prior and posited causal relationship to an isolated dependent variable. Contemporary popular interest in 'holistic' strategies for understanding patterns of events reflects the popular perception that narrow conceptualisations of causation have contributed to technological interventions with serious unforeseen consequences. However, it is not necessarily the case that 'Western science' has not recognised the necessity for systemic or holistic analyses of patterns of events; the terrible technological errors of the twentieth century are more demonstrably the result of the way the practice of at least applied science has been influenced, controlled and exploited for the benefit of narrow (usually economic), and often short-term interests. The contemporary reader, however, will find in the writings of the Ancient Greeks, and especially in the medical writings, a refreshing sense of the interrelatedness of patterns of events that gives the impression of an ancient wisdom, which we are only now rediscovering. This ready recognition of the embeddedness of events in causally relevant contexts is, however, an artifact of the smallness of the world of the Ancient Greeks, and of the relative novelty and unsophistication of their explanatory practices. I would argue that the Ancient Greek conceptualisation of opposites as causal and the converse conceptualisation of causality as synchronically systemic and sometimes optimally 'balanced' can be understood as arising from an attempt to map causation using opposites as navigation points. This resulted largely from the use of contemporarily recognisable basic epistemological tools employed in equally contemporarily recognisable emerging forms of public epistemological activity, rather than arising from a culturally idiosyncratic reading of environmental data. The epistemic factor upon which I have focussed in this

section is the role in opposition of comparative relations, and of ordered series that can be constructed from them.

iv) Axiarchism and Asymmetrical Opposites

...the classification of phenomena into opposite groups may reflect, and itself form an important part of, a system of religious beliefs which expresses the ideals of the society, and by which the whole life of the society is regulated. (Lloyd, p 80)

An example that Lloyd gives of an 'arbitrary' Greek oppositional theory, with 'no foundation in experience whatsoever' (p 27), is the theory that the sex of a child depends on the side of the womb upon which it was conceived. Preliminary to my later argument (Part III), it is worth noting that the oppositionally-constructed explanatory theories used to account for heavily value-loaded attributes such as sex will tend themselves to exhibit evaluative meanings consistent with the phenomena they are thought to explain. What I mean by this is that if, for example, location on the right side of the womb is thought to account for maleness, which is thought to be superior to femaleness (as it most certainly was), then it is a safe bet that the right side of something was also thought to be superior to the left side of something. Now this may seem an obvious point, however it is worth making in order to make the less obvious point that 'arbitrary' connexions such as that between 'male' and 'right side of womb' may not be so arbitrary after all, and may well fit into a systematic **value hierarchy** which is viewed as explanatory of features of existence, in particular of the **arrangement** of things, including causes and the particular kinds of effects they have. Greek 'science', both taxonomic and explanatory, is strongly influenced by evaluative elements, and thereby has strong axiarchic tendencies⁹⁰. By this I mean not just that an object's existence, or its descriptive difference from another object, might be thought to be explained by its value, or its value relative to that other object, but further that **order**, including causal order, in the scheme of things might be thought to be based on, reducible to, or connected with, some evaluative hierarchy. An example is the connexion made between the right side of the womb and male sex cited by Lloyd; an example of a

⁹⁰Axiarchism is a doctrine advocated most famously by John Leslie. Roughly, it involves holding that goodness has causal power, so that the goodness of the universe is an explanation of its existence. I am extending this concept of axiarchism to embrace non-causal explanatory power.

more ambitious such connexion is Plato's account of the world we experience in terms of the world of Forms - the world we experience has the features that it has precisely because it is an inferior reflection of the real, perfect and enduring world of Forms.

Lloyd, in seeking to understand some of the more unusual or idiosyncratic features of Greek oppositional schemas, examines some explanatory accounts, among them that of F.M. Cornford in 'From Religion to Philosophy'⁹¹. Interestingly, Cornford claims, according to Lloyd, that 'the prototype of all opposition or contrariety is the contrariety of sex'⁹², a claim that would find sympathy in much contemporary radical feminist theory⁹³. Lloyd explains that, in Durkheimian fashion, Cornford saw humans' taxonomy of nature as based on social taxonomies, and observed that sex was a basic and dominant social category in many primitive tribes.

Lloyd and others, as we will see, recognise clearly that females are associated with the 'inferior' side of systems of opposition (left, dark, below, behind), but treat it as an accidental if ubiquitous (although not universal) social fact. My central point here, once we are alerted to the possible significance of this 'ubiquitous social fact', is, however, to point out that **value taxonomies**, that is, classifications of objects in arrangements that reflect those objects' positions in a **value** hierarchy (whatever else these arrangements may reflect) are central to many Ancient Greek and others' uses of opposition.

⁹¹London, 1912.

⁹²Op. cit., p 65, quoted in G.E.R. Lloyd, p 23.

⁹³Terminology in feminism is fluid, however by 'radical' feminism I mean that paradigm of feminism which takes the sexual divide to define the fundamental power relationship, in the sense of grounding or facilitating the development and maintenance of all other power imbalances. A representative radical feminist text is Shulamith Firestone's The Dialectic of Sex: the Case for the Feminist Revolution, London: The Women's Press (1979).

In *Metaphysics*⁹⁴, Aristotle lists a table of oppositions that he attributes to the Pythagoreans:

limit	unlimited
odd	even
one	plurality
right	left
male	female
resting	moving
straight	curved
light	darkness
good	bad
square	oblong

Ferguson⁹⁵ refers us to the *Nicomachean Ethics*, where Aristotle describes the left hand column (above) as 'the column of the goods'⁹⁶, and Ferguson goes on 'as Ross remarks, the attribution of left and female to the second column is because they were deemed base or inferior rather than even or undefined.'⁹⁷ More recently, Genevieve Lloyd⁹⁸ has explicitly addressed the value implications of influential oppositional schemas such as the Pythagoreans' upon the evolution of the idea of 'Reason' in Western philosophy, in particular in relation to the feminine⁹⁹.

As I will explain in Part II (Chapter 2), G.E.R. Lloyd uses the notion of 'religious', or 'spiritual' 'symbolism', which he has adopted from Hertz¹⁰⁰, to articulate what I have described as the value influences on both 'primitive' and

⁹⁴986a, approx. 22-27, W.D. Ross (transl.), op. cit.

⁹⁵Op. cit., p 5.

⁹⁶1096b, 6. W.D. Ross, (transl.) in McKeon. op. cit.

⁹⁷Op. Cit.. I cannot decipher the reference he gives here, but 'Ross' is certainly W.D. Ross.

⁹⁸Not to be confused with G.E.R. Lloyd, author of *Polarity and Analogy* which has been frequently cited in this Part.

⁹⁹Genevieve Lloyd, 2nd ed. (1993) *The Man of Reason - 'Male' & 'Female' in Western Philosophy*, London: Routledge. This work will be discussed in more detail in Part III.

¹⁰⁰He cites Hertz, R. 'La preeminence de la main droite: etude sur la polarite religieuse', orig. publ 1909, R. and C. Needham (transl.) in *Death and the Right Hand*, London: 1960.

Ancient Greek oppositional taxonomies¹⁰¹. Applying the notion of 'religious polarity' directly to the early Greeks, Lloyd explains that, for example, the apparent opposites 'sky' and 'earth' were associated with religious antitheses, such as the contrast between gods and men, immortal and mortal (p 42). Right and left represent an 'auspicious'/'inauspicious' contrast. Males were considered superior to females and, he says, females were explicitly connected with sources and manifestations of evil. Light/dark, similarly, has strong value connexions, light being connected with life, safety and deliverance in Homer, and, reports Lloyd, later with 'good news, joy, fame, marriage, wealth and virtue' (p 43). Night has opposite connotations (e.g. terror, death, misery, strife). While value connotations (for Lloyd, 'religious polarities') were not so clear in pre-philosophical texts for the opposites hot/cold and wet/dry there were 'ambivalent' associations, for example of dryness and coldness with death, of warmth and wetness with life (p 44-45). Lloyd points out that these value connotations occur 'by *association* in different contexts' (p 46), a feature of value-influenced opposition that will be discussed in detail in Part III. These and other oppositions (white/black, up/down, high/low) have their 'spiritual' connexions, according to Lloyd, in part because of features of experience (e.g. the association between 'sky' and 'up'). Others are, according to him, arbitrary (e.g. 'right' and 'east'). Lloyd concludes that while no rigid Table of Opposites existed pre-philosophically, cross-oppositional associations appeared early in Greek literature, and

...in some cases the correlations which were made appear to have been determined not so much by what is given in nature, as by the symbolic values which the opposite terms possessed. (p 48).

It seems, then, that the oppositional taxonomies used by the Ancient Greeks are recognised by commentators to be strongly influenced by value, a claim that will be discussed in more detail in Part II of this work, and elaborated in the context of political imperatives in Part III. In Part II, I will argue that oppositional classification schemas such as those used by the Pythagoreans reflect and are influenced by evaluative judgements and classifications, and that this is a

¹⁰¹In Part III, I argue in greater detail that conjectured religious or spiritual influences are mere species of a more general category of **value** influence on these taxonomies.

phenomenon generated by the logical structure of opposition, and in particular the logical structure of the oppositional good/bad contrast. However, preliminarily, it seems clear that these are, at least in part, strongly influenced by value¹⁰². I will later argue that it is value opposition which accounts (in part) both for the overall structure of these oppositional schemas, and for particular pairings in them.

¹⁰²I say 'in part' because, as I will later argue (following R.M. Hare; see, e.g., The Language of Morals, Oxford: O.U.P. 1983), value contrasts are grounded partly on descriptive differences, so that it follows from the claim that (for example) 'male is better than female', that there are descriptive differences between male and female. However, again as I will later argue, there is considerable mutual influence between descriptive and evaluative classification.

Chapter 4. The Logic of Opposition

i) Negation and the Square of Opposition

George Englebretsen¹⁰³ seeks to rehabilitate **term** logic because it permits more detailed scope distinctions for affirmation and, in particular, negation. This greater detail is attractive for several reasons, among them that it is more reflective of ordinary language (1981, p 2¹⁰⁴), that it helps account for various kinds of truth paradoxes (op. cit., esp Ch V), and that it permits a clearer understanding of Aristotle's Square of Opposition (1976, 1981 and 1984¹⁰⁵).

According to Englebretsen, a sentential logic holds negation to be always **sentential** in scope, and the appending of a negation (e.g., 'not') to a sentence always transforms an **atomic** sentence into a **compound** one (so, for example, the atomic sentence 'The cat is black' is transformed into a compound sentence by 'not' in 'The cat is not black'). The atomic sentence does not contain negatable constituent parts.

However, in a term logic, sentences are thought of as containing terms in both subject and predicate positions. Both predicates ('is black'), and the terms they contain ('black'), can be negated, and the negations that occur in sentences may apply to either predicate or term (I will return to the question of negating subject terms).

While a term negation (e.g., 'is not-black') implies the negation of the predicate containing the affirmed term (i.e., implies the negation of the predicate 'is black'), a

¹⁰³George Englebretsen (1981), *Logical Negation*, Assen (Neth): Van Gorcum.

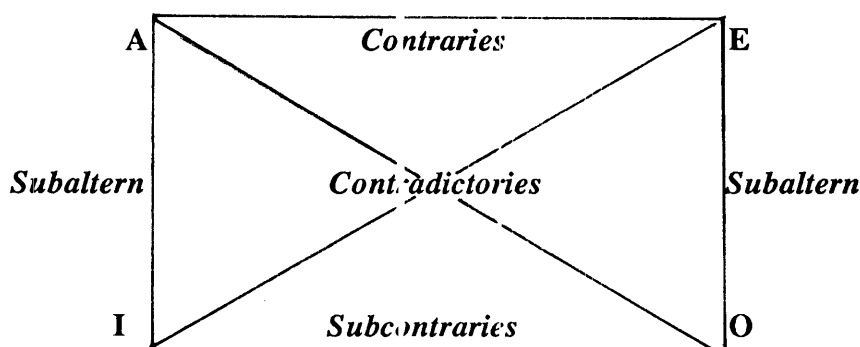
¹⁰⁴Englebretsen, op. cit.

¹⁰⁵(1976), The Square of Opposition, *Notre Dame Journal of Formal Logic*, Vol XVII, No 4, Oct, pp 531-41. (1981), op. cit., esp Ch III. (1984), Opposition, *Notre Dame Journal of Formal Logic*, Vol 25, No 1, Jan, pp 79-85.

predicate negation implies a disjunctive set of possibilities: the predicate relationship can fail for reasons other than that the term's negation stands in the required predicative relation to the subject. For example, it can fail because neither the term nor its negation stand in this relation to the subject (e.g., in the case of 'The cat is an odd number'/'The cat is an even number', 'The cat is not an odd number' is not true because the cat is in fact an even number, but because the cat is neither an odd nor an even number.

The interactions between predicate and term negations generate, according to Aristotle (*On Interpretation*, 19b 24-30), four possible variations: affirmed predicates, denied predicates, and within these, terms and their privations. Englebretsen argues (1976, 1981) that these four variations exhibit between them the logical relations that define a Square of Opposition (and in fact count as a 'general square of opposition', p 5, 1981). A Square of Opposition is an arrangement of propositions that exhibit the following relations¹⁰⁶:

Figure A: *The Square of Opposition*



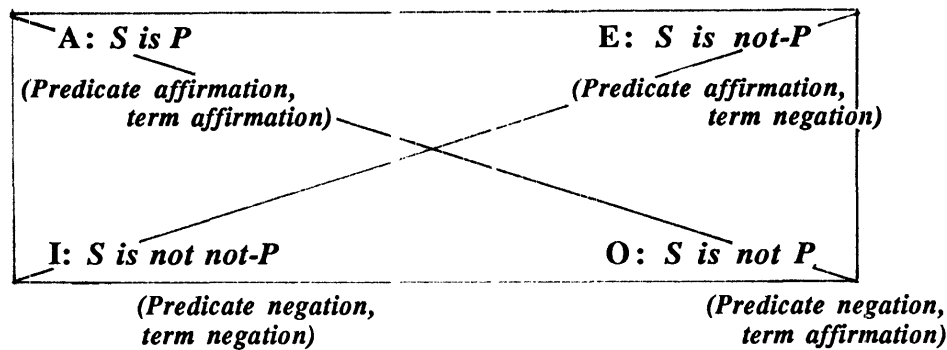
¹⁰⁶The labelling of the positions with A, E, I and O is a convention that arose in the Middle Ages, according to W. and M. Kneale (1962), *The Development of Logic*, London: Oxford University Press. Traditionally, the Square of Opposition has been associated with categoricals, combining universal/particular distinction with affirmation and negation. Englebretsen argues that this is merely an instance of a more general form of the Square (this claim will be discussed presently). I will treat the Square as being defined not by content, but by the logical relations exhibited between the positions on the square.

- i) A and E are **contraries**: this means that if one of A or E is true, then the other must be false (both can't be true). However, both may be false.
- ii) I and O are **subcontraries**: this means that if one of A or E is false, then the other must be true (both can't be false). However, both may be true.
- iii) I is **subaltern** to A and O is subaltern to E: this means that if A is true, then I is true (and if E is true, then O is true).
- iii) A and O are **contradictories** and E and I are contradictories: this means that if one is true, the other must be false, and if one is false, the other must be true.

Englebretsen argues (both in 1981 and 1976) that the formal relations between 'S is p', 'S is not-p' (predicate affirmations) 'S is not p' and 'S is not not-p' (predicate negations) describe the 'most general' form of the Square, the traditional four categoricals ('Every S is p', 'Every S is not-p', 'Not every S is p' and 'Not every S is not-p') being only an instance of this square.

He argues for this view by giving a negation-scope account of the **contrariness** of S is P and S is \sim P (predicate affirmations, varying in term negation) and of the **contradictoriness** of S is P and S is not P and of S is \sim P and S is not \sim P (predicate affirmation/negation pairs, holding term constant). **'S is neither P nor \sim P'**, which is implied disjunctively with 'S is \sim P' when 'S is P' is negated, is the crucial factor in generating a Square of Opposition from negation-scope differences. It is this possibility that guarantees that 'S is P' and 'S is \sim P' are contraries, rather than contradictories, and that guarantees that 'S is not \sim P' and 'S is not P' are subcontraries, creating the characteristic logical relations between the A, E, I and O positions on the Square. Englebretsen, then, is arguing that the differences that he identifies between term and predicate negation generate propositions that can occupy these A, E, I and O positions, as follows:

Figure B: *The Negation-Scope Square of Opposition*



This account of the Square of Opposition, however, is only the first step in understanding the relations between negation and opposition. If we define a Square merely by its logical relations, the contraries in the A and E positions need not be recognisable as opposites at all. For example, the propositions could be 'The cat is on the fence'/'The cat is in the yard'. These two propositions could take the A and E positions on the square and exhibit exactly the same relations that are exhibited by two propositions differing only by a term negation. It is therefore worth examining the content, as well as the logical relations, of Aristotle's original Square.

The contradictories are opposites on Aristotle's taxonomy of opposition ('affirmation and negation' opposition), but what are the term negations that figure in the affirmations in the A and E positions? Englebretsen argues that they should be construed as Aristotle's 'privatives', e.g., sighted/blind). As he says (1981, p 5)

If a quality, P, is privative to a thing, then it is correct to affirm 'not-P' of it. On the other hand, if P is neither possessed by nor privative it (i.e. *impredicable of*) the thing, then, while it is correct to deny 'P' of it, it is not correct to affirm 'not-P' of it.

But as Aristotle explains (*Categories*, Ch 10, 12a, 25-30):

'Privatives' and 'positives' have reference to the same subject....It is a universal rule that each of a pair of opposites of this type has reference to that to which the particular 'positive' is natural...it should naturally be present.

It is not sufficient to define Aristotle's privatives and positives as mutually dependent dichotomous divisions of predication fields. Their special relationship to the subject has to be explained. It is not the necessary descriptive relationship (such that one or the other must apply, or neither applies) characteristic of dichotomous predication divisions, because Aristotle thinks that we would not attribute, e.g., 'blindness' to something which was not yet at the stage of development to see (13a, 5-10). This possibility grounds his argument that positives and privatives can have intermediates (can both fail to apply). Thus, in Englebretsen's terms, 'P' can 'neither be possessed by nor privative to' a thing, yet still not be 'impredicable' of it in Aristotle's sense of the thing's not being 'receptive' to it. Rather, this special relationship derives from the fact that positives and privatives are in addition value terms: the privative has a negative value connotation implying 'abnormal' (or, in some of Aristotle's discussion, 'damaged'). As we will see in Part II, the kind of comparative evaluation that is reason-based is applied to things as things of a certain kind, and hence evaluations for one kind of thing may not be relevant to another kind of thing. Further, the positive and negative value categories in such an evaluation are mutually dependent, and both 'have reference to the same subject', because the criteria for their application are linked. They must have certain logical relations to each other (e.g., a criterion for 'normal' cannot also be a criterion for 'abnormal', and vice versa) and to the nature of the kind of thing being evaluated (e.g., the criteria for being an abnormal cow are not the same as those for being an abnormal tree). This explains the 'special reference to the subject' to which Aristotle refers. Incidentally, 'normal' and 'abnormal', or 'intact' and 'damaged', as value terms, name dichotomous parts of value scales, which makes them dichotomous or trichotomous scalar opposites of a fairly ordinary kind, and it is this that gives the character of oppositionality to his privatives.

Not all term negations have value connotations - for example, 'big' and 'not-big' do not have a consistent value connotation. Some more general account of term negations is required. Englebretsen suggests an account that he has developed from a non-evaluative model of Aristotle's privatives. He argues that the privation of a term denoting a property can be defined as the disjunctive set of terms denoting properties that are **incompatible** with that property:

Let us say that any two qualities are contrary (e.g. red-yellow, red-black, black-white, heavy-light, round-square, square-triangular, in Boston-in London) if and only if they are incompatible, cannot inhere together in the same subject. We will call such predicate term pairs *contraries*. (His emphasis, 1976, p534).

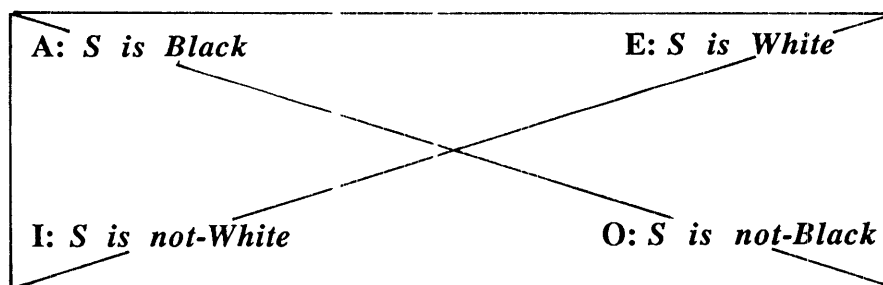
Note, however, that Englebretsen's list of contrary pairs of qualities is an oddly mixed one: red-yellow is not the same kind of contrary pair as black-white (which are opposites), and it's worth adding that black/not-black has a different character again from these. Black and not-black are contradictories by reference to a subject-field or background epistemic field defined by 'possibly being black' (i.e., they are contradictories within the field of application in which blackness is possible, or, as Englebretsen puts it, for subjects of which black and not-black are both predicable), in my terms, they are a dichotomous division of the epistemic field containing everything which can be black, black's 'predication field'. Englebretsen calls these *logical contraries*, (1976, p 534; 1981, p 6) but this terminology is misleading, failing to capture the **contradictoriness** of their relationship within their field of possible application, something essential to their epistemic function. Further, this terminology obscures important differences between such contradictories and **within-field contraries**, (red-yellow, black-white) and between these latter and **contrary propositions** generated by the application of these terms outside their predication field, which can contain 'logical contraries' or within-field contradictories as terms. For example, 'Everything is black' and 'Everything is not-black' are contrary propositions. This latter confusion has in my view generated considerable confusion about contraries, both originally in Aristotle and in much subsequent discussion of opposition. The confusion is significant because within-field contradictories are a kind of opposite (dichotomous opposites), and among within-field contraries can be distinguished another kind of opposite: polar or extreme contraries (e.g., black/white), arising from trichotomous division, which accounts for Aristotle's view ¹⁰⁷ that contraries express extremity of difference (a view that Englebretsen, not surprisingly, is forced to reject).

Further, intuitively it seems that there is a place on a square of opposition for contraries like 'black and white' (to which Aristotle frequently refers in his accounts

¹⁰⁷E.g., *Metaphysics*, Bk V, Ch 10, 1018a.

of both negation and opposition) that contraries of the 'red-yellow' sort just do not have, and that it is therefore a mistake not to qualitatively differentiate these different kinds of contraries (as Englebretsen does not). The following square of opposition, for example, is possible, and **all predicates are affirmative** (that is, they do not arise from the negation scope differences described by Englebretsen):

Figure C: A Predicate-Affirmative Square of Opposition



This can hold as a square of opposition, exhibiting the relations of contrariness between A and E, subcontrariness between I and O, and subalternation between A and I and E and O), **within** the fields of mutual exclusiveness and exhaustiveness of black and not-black and white and not-white. (Or, to put this another way, these relations will all be exhibited even if everything is either black or not-black and everything is also either white or not-white). Black and white are **polar** contraries, that is, contraries which do not arise from the scope differences in negation underpinning Englebretsen's Square of Opposition (described above). Negation is involved in their opposition, and a clue to how it is involved can be found in Englebretsen's proposal that the privation of a term should be construed as the disjunctive set of properties incompatible with what the term denotes. I will return to this question presently.

ii) Classical Negation: Conflating Spotlight and Toggle Negation.

As R. and V. Routley remark (1985, p 201¹⁰⁸): 'Negation is a fundamental, but ill-understood, ill-explained and much disputed notion across a wide philosophical

¹⁰⁸R. and V. Routley, *op. cit.*

spectrum.' According to them, different models of negation are frequently confused in contemporary literature (p 210). They use the different ways of relating A to $\sim A$ (i.e., different conceptualisations of contradiction) to provide a threefold initial classification of theories of negation. The first involves a 'cancellation' picture of contradiction, where A and $\sim A$ mutually cancel each other out; because of this, the conjunction A and $\sim A$ entails nothing (in particular, it does not entail either of A or $\sim A$), and further, A cannot entail $\sim A$.

The second involves what they describe as an 'explosion' picture of contradiction, in which A and $\sim A$ conjoined entail everything. R. and V. Routley argue that the 'explosion' view, is closely connected with classical negation¹⁰⁹. Classical negation is a 'complete exclusion' model of negation, and further, since $\sim A$ covers everything (on a world, a) not covered by A, it is also exhaustive (in conjunction with the corresponding affirmation) (p 207, op. cit.) This model of negation, according to R. and V. Routley, is widely thought to be the ordinary and only possible model of negation, a view that they reject.

On the third view, A and $\sim A$ mutually constrain each other. This view of negation, according to R. and V. Routley, permits the development of the notion of 'relevant' negation. On a model of relevant negation, contradictions neither entail nothing, nor everything, but rather have the same entailment potential as other kinds of propositions (p 209). The 'normal' semantic rule for relevant negation is ' $\sim A$ holds in world a iff A does not hold in world a*, the opposite or reverse of a.' (p 209). On this view, according to R. and V. Routley, A and $\sim A$ are related but independent, and do not, conjoined, result in entailments of nothing, or everything. Among other advantages, the 'star' rule, a 'generalisation' of classical negation according to them, is a 'natural reversal operation' (p 209).

Where what I have described as a 'spot light' affirmation is made, what is affirmed is **exhaustive** of the epistemic field or domain relevant to the epistemological

¹⁰⁹Given, according to them, 'weak, and relatively noncontroversial, conditions on other connectives' (p206, op. cit.). Classical negation is understood in terms of the following semantic rule: 'A holds at world a iff $\sim A$ does not hold at a, for every world a'. R. and V. Routley point out that since on this rule no world having A and $\sim A$ also lacks B, (no world has both A and $\sim A$), this rule is consistent with the 'explosion' view where A and $\sim A$ imply (any, arbitrary) B (p 206).

activity in which it has a role. On this view, we can picture A's 'border' as one-sided (there is an 'inside' only), and there is no 'other' against which p is contrasted. While A stands alone epistemically, there is no epistemic space for $\sim A$. The 'off' position of the spotlight destroys **both A and the A/ $\sim A$ contrast** which gives $\sim A$ sense. This is why a 'spotlight' $\sim A$ is 'epistemically negative'; it has no meaning without A, and spotlight negation is not recursively involutory. 'Toggle' negations, on the other hand, are epistemic positives, which complement toggle affirmations, together comprising a spotlight epistemic field which they mutually exclusively and exhaustively divide.

Spotlight and toggle negations, however, work together hierarchically in the structuring of epistemic fields and in the propositions that map them. I have argued that there is an important difference between different kinds of negation: that spotlight negations, for example, in being epistemically negative, cannot be subjects in propositions. Any apparent subject negations in propositions, then, must be toggle negations from larger epistemic fields spotlighted as subjects (recalling, as I earlier argued, that any part of an epistemic field can be spotlighted by the subject position of a proposition, an act which 'switches off' the surrounding field for the epistemic purposes at hand).

That subjects are always spotlighted affirmations is evident from the fact that pairs of propositions containing affirmed and negated terms in subject positions, but otherwise the same, do not contradict each other. Subjects locate the propositional map. Different subjects do not engage, because they belong to different epistemic fields. The subject is 'everything' on the propositional map and neither precludes nor is precluded by a subject on any other propositional map.

However, we can apply these structures in various ways over epistemic fields. We may wish to spotlight one side of a toggled area with the subject position of a proposition, for example. Or we may wish to expand our epistemic field beyond a spotlighted area, while retaining the distinction between that area and the expansion. This facility, however, also facilitates confusion, because the orders of analysis appropriate to spotlight and toggle negations can be conflated.

Spotlight negations are transformed into involutory 'toggle' negations by suitably defining a background field (to a useful degree) incorporating the spotlight area. This practice, however, especially when the background field is vaguely assumed to be 'everything', or 'the universe', is a major source of spotlight/toggle conflation. We can visualise the transformation of a spotlight affirmation into a toggle affirmation as the drawing of a rectangle around a circle (the formerly spotlight area). Interestingly, this is exactly the way that classical negation is graphically represented, according to R. and V. Routley: 'In classical logic negation, $\sim A$, is interpreted as the universe without $|A|$, everything in the universe other than what A covers, as reflected in the Venn diagram' (p 216-7).

The specification of a background field for an affirmation is an element easily overlooked, left unmentioned, contextually implied or presupposed, and so left vague or indeterminate. Toggle and spotlight negations become conflated when we, having failed to specify that A exhausts the epistemic field or domain, or having failed to specify the background field comprising A and $\sim A$, proceed on some occasions as if there is no field beyond A (and hence as if we have an epistemically negative negation), and on other occasions as if A is one side of a toggle partitioning areas of A and $\sim A$ within the background field 'everything', or 'everything else'.

Only the 'explosion' view of A and $\sim A$ (consistent with toggle negation) is attributed by Routley et. al. to classical negation semantics; in my view the negation semantics of **both** toggle and spotlight negation are ambivalently incorporated in classical negation¹¹⁰. A characteristic feature of classical or classical-based negation semantics is that they equivocate across two conflicting emphases. Classical negation represents affirmation and negation as very like Aristotle's privatives, e.g., the contrast between 'black' and 'not-black'. While the complementarity view (A and $\sim A$ imply, or add up to everything) presupposes an epistemically positive $\sim A$, which is characteristic of toggle negation, there is also a strong connotation that $\sim A$ is a 'mere lack'.

¹¹⁰And hence in the politico-logical category of 'otherness' that Plumwood (V. Routley) examines in, e.g., Feminism and the Mastery of Nature (1993, op. cit.), which will be examined in Part III.

This latter results in part from the phenomenon of the 'infitation of the negative' (a problem with which Routley et. al. are also, not surprisingly, concerned). Dewey says (p 192): '...if, say, 'virtue' be assigned to *A* as its meaning, then *Not-A* includes not only vice but triangles, horse races, symphonies and the precession of the equinoxes.' Dewey gives two reasons for this phenomenon, one of which involves failure to specify the 'universe of discourse' (the context of the *A/Not-A* contrast), a failure which makes the negative 'indeterminate'. This is characteristic of spotlight negation. What has occurred is that a toggle negation's perimeter (the background field it dichotomously divides) has become ambivalently both present and absent, leading to, on the one hand the treatment of objects (horses, equinoxes) off the field as epistemic positives (this comes from the 'toggle' interpretation), and on the other hand, as unbounded (this comes from the 'spotlight' interpretation).

Finally, there is another potential source of conflation of spotlight and toggle negations, arising from a certain use of toggle negations. Aristotle is especially concerned to note that in privative contrasts (which take the logical form $A/\sim A$), the 'having' is natural or normal for the subject, and as I have argued, privatives are in fact evaluative contrasts marking deviance, abnormality or damage. There are, however, epistemological cases of abnormality. In such cases, because the subject **should** have the property, the lack, **in itself**, is significant. It is not important what the subject has in place of the property, and so this is not specified, highlighted or mentioned in the contrast. Rather, what is important is the **lack**, in itself. Now, to take an example, imagine a world in which cats are very rarely any colour other than black, so that, epistemically, cats 'should' be black¹¹¹. Occasionally, however, we come across abnormal 'not-black' cats, so that what we immediately notice, communicate and record about such cats is that they are not black. With regard to colour (we might be in the habit of thinking), cats are in general black, but some (unusually) are 'not-black'. The very oddity of this has a value-epistemic influence - what specific form the not-blackness takes is not interesting - what is interesting is that the cat is not black. Such cases are cases

¹¹¹It should be remembered that in this context I am using 'should' epistemically. In Section III of this thesis claims analagous to the value claim that cats should be black, or that black cats are good compared to non-black cats which are bad, will be seen to have important connexions to claims presented as purely epistemic 'shoulds' in ideological contexts.

where the toggle contrast $A/\text{the rest}$ has inflated epistemological salience, even though 'the rest' contains distinctions that are empirically on a par with $A/\sim A$ (so it can be thought of as an empirically asymmetrical toggle contrast).

This application of toggle negation, then, has important semantic similarities to the spotlight form, and, again, readily facilitates conflation with that form.

Conflations of 'spotlight' and 'toggle' negations are, then, the most likely origins of the flawed semantics of classical negation, which, as we will see in Part III, is a structural feature of those politically-inflected oppositional constructions known as 'binarisms' or 'dualisms'. Further, such conflations appear to be implicated in the 'infinite negation of the negative', a phenomenon which bears on the problem of relevance (epistemic symmetry) between affirmations and negations. Epistemic symmetry is a matter of opposition of content, and ways of explicitly developing it as an epistemic tool are sought by advocates of relevant negation.

iii) Star Negation - An Opposition Operator.

Routley et. al.'s 'star' rule is, according to them, a 'natural reversal operation' (p 209¹¹²), and so is oppositional. The 'normal' semantic rule for relevant negation is ' $\sim A$ holds in world a iff A does not hold in world a^* , the opposite or reverse of a .' (p 209, 1985). However, it is not clear why, if something is to be **negated** in a , if it **does not** hold in a^* , a and a^* are opposites. Intuitively, we would expect a 'lack' in one world to correlate with an affirmation in the other world, and vice versa, if those worlds are opposites. However, paying attention to Routley et. al.'s aim of guaranteeing relevancy in negation, as well as their use of 'does not hold' and ' \sim ' in their formal rule, we may be able to understand why $*$ is oppositional, or at least, in some sense, an 'inverse' operator, through a Square of Opposition.

Let us take 'does not hold' to be **analogous** to predicate negation on Englebretsen's Square of Opposition, and ' \sim ' to be **analogous** to term negation (I do not mean to suggest that this is literally what is meant by Routley et.al. However

¹¹²Op. cit. The 'star' rule is also discussed in *Relevant Logics and Their Rivals 1.*, by Richard Routley with Robert K. Meyer, Val Plumwood and Ross T. Brady, Independence (Ohio): Ridgeview (1982).

it may be significant that they remark that the confusion between different models of negation 'appears to originate in Aristotle', p 211). Following this analogy, if 'not holding' in 'a' implies ' \sim ' in 'a*' what * does is invert the subaltern relationship, that is, the direction of implication, between the A and I positions, and the E and O positions, on the square. Instead of ' \sim ' implying 'not', but not vice-versa, 'not' implies ' \sim ' and not vice-versa. In this sense, then, * is an inversion. It is an inversion of the implication relationship between contraries and subcontraries on the Square.

Routley et. al. are concerned, among other things, to exclude irrelevant ('infinitated') negations from the relations between propositions and their negations. The examples that are given in the 1985 paper of the relations between 'a' and 'a*' include the presentation of opposite sides of an argument or debate, and the opposite sides of a double-sided recording. With regard to the debate example, they say (p 218) '...to present the case for the other side, the negative, is *not* to present the case for everything, to exhaust what can be said, etc.' (their emphasis). And with regard to the record example, they say (p 219): '...classical negation takes p as one side of one record, and \sim p as everything else in the cabinet (classical theory fails to duly separate issues).' On the interpretation of * that I have given, irrelevant, 'infinitated' negations drop out in the movement from 'not' to ' \sim ' on squares in which the affirmation row contains contraries and the denial row contains subcontraries. The subcontraries are such because **both** 'Not \sim p' and 'Not p' can be true. This will be the case when, for example, S is not such that it can either have or lack p (e.g., so that both '2 is not not-red' and '2 is not red' are true). It may be, then, that * is a device for narrowing down the subcontrary 'not' relation to the contrary ' \sim ' relation, by dropping out irrelevant instances of 'not'. If negation is construed as more like the horizontal relationship between the propositions on the affirmation row of a Square of Opposition than it is like the logically ambiguous 'not' in the diagonal relationship on the Square, then it is a more focussed and relevant form of negation; it is more like the contrast between two sides of a debate or the two sides of a record than is the classical global exclusion model.

Squares of opposition can be inverted so that the A and E positions are subcontraries and the I and O positions are contraries, e.g., where S is P and S is

$\sim P$ can both be true. Presumably $*$ in such cases again inverts the subaltern relationship (so that, e.g., if a has A , then $\sim A$ does not hold in a^*). If this is so, then if S is P and S is $\sim P$ both obtain in a (if a is a contradictory world), then neither S is P nor S is $\sim P$ hold in a^* (a^* is incomplete). This is consistent both with Routley et. al.'s claim that $*$ is involutory, and that it permits incomplete worlds as well as inconsistent worlds (the inference from denial subcontraries to affirmation contradictories on a standard Square implies that there will be inconsistent worlds). On my interpretation of $*$, it will transform an incomplete world into an inconsistent one and vice versa.

The $*$ operator is an oppositional operator through selecting, for a subfield of a background epistemic field, the maximally different subfield. At the level of particular predicate relations in those subfields, $*$ and toggle negation together will 'flip' the predication relation into the opposite subfield (along the diameter of the circle, on the circle metaphor of predicate relations as radii joining a subject centre and circumference terms). We can interpret the operations of $*$ in converting a contradictory 'world' or epistemic field into an incomplete one and vice versa in the following way. We can picture matched incomplete and inconsistent worlds (or epistemic fields) as maximally different, mutually exclusive and exhaustive subfields of background fields which are complete and consistent. The $*$ operator will in this case act exactly like a toggle, switching back and forth between the incomplete and inconsistent subfields, either of which can be spotlighted for further epistemic organisation. This will not be the case for pathologically contradictory epistemic fields. The difference between these and legitimate fields will be more apparent from discussion Part III, Chapter 2, Section i), where I argue that infinitated and radically heterogeneous epistemic fields necessarily contain contradictions through a compression of orders of analysis. Such fields are epistemically pathological in part because the contradictions they contain have no epistemically robust negations (due to infinitation). If we need to use a contradictory epistemic field, then, the strategy of pairing it as a toggling subfield with a matched incomplete field 'quarantines' the contradiction (and will also 'quarantine' incompleteness) so that ultimately toggling relations on the background field are not compromised, and paradoxes will not spread through the larger organisational structure of which the contradictory or incomplete field is a part.

Both negation-scope ambiguities and spotlight/toggle conflation generate epistemically asymmetrical contrasts between affirmations and negations. The function of * is to ensure such contrasts are symmetrical. Recall that I argued that toggle negation is able to facilitate the compacting of symmetrical epistemic fields. A world and its *world are symmetrical epistemic fields or subfields. From the point of view of predicate divisions of fields, for example, transforming 'lacks P' into 'has ~P' is part of a rule for lining up predicates and predicate terms as toggles (i.e., the rule is: 'lacking P implies having ~P', and 'having ~P' implies 'lacking P'). But this is merely an instance of a general symmetrical information encoding strategy that can apply at any level of epistemic generality.

It also bears on opposition. If we think of epistemic fields, again, as circles, divided into various mutually exclusive and exhaustive segments, we can think of negations as switching us through those segments. The * function narrows epistemic focus to symmetrical segments; the switching then is limited to the symmetrical area of the field (we can think of the predicative radius as being flipped over the centre along the diameter of which it is a part). The points joined by the diameter of a circle are the paradigm of opposition, and various kinds of opposition can be pictured as utilising variations on this basic structure. This explains Routley et. al.'s conceptualisation of * as an inverse or oppositional operator.

iv) Semantic Opposition

Semantic opposition involves epistemic symmetry. I have argued that Routley et. al.'s * function is designed to mark off symmetrical epistemic fields, over which we can then use toggle negation. The * function turns contradictory opposition between an affirmation and a negation, which is logically but not semantically dichotomous, into genuine semantic oppositional contrast. The question now remains of how we construct the symmetrical epistemic fields over which * can operate. The clue lies in a recurrent feature of the epistemic models offered throughout this Part: that finer epistemic structures stand like fractals to the larger epistemic structures containing them.

The proposition, like the epistemic fields it maps, should ordinarily be constructed as a hierarchical series of toggles¹¹³ culminating in the spotlight subject position. Recognition of this makes different kinds of oppositionality within the proposition more clear. The 'Square of Opposition' is itself ambiguous about what exactly count as the opposites. Aristotle took contradictories to be the relevant opposites, but the contraries in the affirmation row are also potentially opposites. We could say that the contradictories are truth-value opposites, and oppositional contraries are semantic opposites. Contradictories (like all dichotomies) satisfy the definition of opposition above, of extremity of difference within a kind. However, the contradictories on an a Square are an artifact of the conflation of negations at different levels of a propositional hierarchy. 'S is not p', while successfully ruling out 'S is p', is not a relevant, that is, adequately focussed, alternative to 'S is p', not a semantic opposite. This is a point that bears on the approach to negation taken by Routley et. al.

A clue to how negation is involved in semantic opposition can be found in Englebretsen's proposal that the privation of a term should be construed as the disjunctive set of properties incompatible with what the term denotes.

Englebretsen has argued that the privation (not-P) of a term (P) should be construed as the disjunctive set of all properties incompatible with P. Let us imagine that P is a compound property, p and q¹¹⁴, and that within the field of things of which P and its privative are predicable, these things can have either p and q, or p and \sim q, or \sim p and q, or \sim p and \sim q. Not-P, then, amounts to the disjunctive set of p and \sim q, \sim q and p, and \sim p and \sim q. Each of these disjuncts is a within-field contrary of P and of each other. Their disjunction is the within-field contradictory of P. Of these disjuncts, which is the 'most distant' from P (i.e., from p and q)? All of the objects

¹¹³A higher level toggle could be something like 'It is true that/It is false that', and lower level toggles could be implicated in the term p/ \sim p contrast, something that will be discussed in the context of semantic opposition in Section iv.

¹¹⁴ Or that P materially implies p and q. In empirical applications, it could be that the having of P empirically necessitates the having of p and q, or usually does so, or does so by definition, or is mistakenly thought to do so, or whatever. The example that I have in mind is the example of human sex, which is argued by sociobiologists and others to differentiate human beings not just on its own account (whatever criterion of sex may be used) but to empirically necessitate a whole raft of other properties such as, for maleness, aggression, sexual promiscuity, and so on. This kind of example will be explored in more detail in Part III, Chapter 2, Section ii of this thesis.

of which not-P is predicable are different from an object with P, but which of these objects is **most** different from an object with P, given what we know of objects with P and objects with not-P? Obviously, it is that object which lacks both properties that an object with P has, the object lacking both p and q, that is, the object with $\sim p$ and $\sim q$.

The kind of object that has ($\sim p$ and $\sim q$) is the disjunct in the privation of P that is **most different** from the kind of object that has P, **within the field** of objects exclusively disjunctively divided by P and not-P. Its maximal distance from P within the field suffices for ($\sim p$ and $\sim q$) to be the opposite of (p and q), in this case it is the **polar opposite** of (p and q) because it is a **polar contrary** of (p and q). Polar contraries are inclusive, but not necessarily exhaustive, of a field.

R. and V. Routley¹¹⁵ use a double-sided record analogy of their 'star' negation rule in order to illustrate the common semantic ground of a world and its corresponding 'star' world. 'Star' negation is to classical negation as the other side of the record is to the rest of the records in the cabinet. The record cabinet analogy, however, is a fertile one: it can also be used to explain how polar contraries can be constructed using toggles.

Treat the two sides of a record, the A and the B sides, as mutually exclusive and exhaustive (you can only play one side at a time and the two sides exhaust the recording). The dichotomous opposite of A is B, and vice versa, just as in comparative negation affirmation and negation are dichotomous opposites. Having turned it to B, turning it again returns us to A, just as applying negation again returns us to the affirmative position of the toggle.

Let us suppose Mary has been told that she may choose a playlist from a record collection of 3, that no more than one side is to be chosen from each record and that no side is to be played twice. Mary can play either side of each of the three records. So she can play Record 1, A or B, Record 2, A or B and Record 3, A or B, for a maximum playlist of three different songs. Let's say her playlist is Record 1, A, Record 2, B and Record 3, A. Now imagine that Mary's brother John appears,

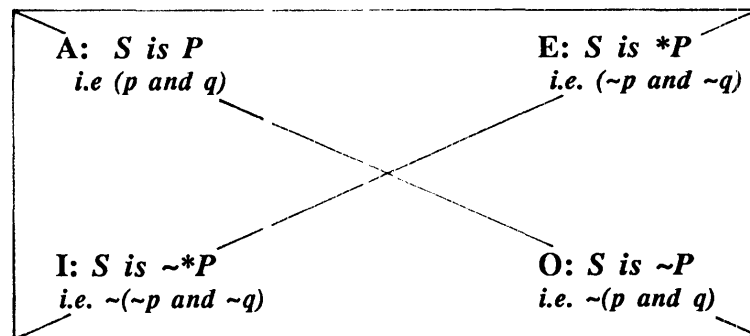
¹¹⁵See the 1985 paper, op. cit., pp 218-20 for this and other examples.

demanding to have a say in the playlist. John prides himself on being as different as possible from his sister Mary, and in addition would prefer that Mary's preference satisfaction is, as far as possible, minimised. It is fairly safe to say that John would choose the opposite playlist from Mary. What would this involve? Simply flipping **all** of the records. That is, the opposite playlist chosen by John would be Record 1, B, Record 2, A, and Record 3, B. This playlist is maximally different from the list chosen by Mary, within the parameters of the possible variations (which is why it is the opposite playlist). It is among the playlists contrary to Mary's, (e.g., Record 1, A, Record 2, B, and Record 3, A), but it is a contrary with a special status - it is the maximally different contrary. Further, John's and Mary's playlists still have the underlying record collection in common. John is choosing the same artists as Mary, but he is choosing different songs of theirs (which counts as maximal difference within a sameness).

This is analagous to a taxonomic strategy in which we use a conjunction of criterial toggles instead of one toggle. In the ideal case, the criteria, call them $a/\sim a$, $b/\sim b$ and $c/\sim c$ are used to differentiate objects in a field in which every object has either a or $\sim a$, either b or $\sim b$, and either c or $\sim c$. With respect to this classification strategy, objects with, e.g., a and b and c are the polar contraries, and hence polar opposites, of objects which have $\sim a$ and $\sim b$ and $\sim c$ (the salience of this opposition will depend on the salience of the criteria chosen). The other possible combinations of properties put an object into the intermediate area between the polar categories.

Polar opposites are within-field contraries and can be arranged on a Square of Opposition. P and $*P$ can be viewed as comprising the symmetrical background epistemic sub-field for relevant toggle negations that will switch us between these opposites (i.e., avoid landing us irrelevantly in the neutral area or off the field):

Figure D: Square of Semantic Opposition



A category in such an arrangement with all affirmed properties will tend to be an epistemically salient pole, and a corresponding opposite category with all negated properties will tend to be vulnerable to conflation with spotlight negations, (and hence 'infinitation', as well as other problems connected with 'privation' uses of toggle negation which will be addressed in Part III). However, we need not have an oppositional relationship which contrasts 'all affirmed' with 'all negated'. It may be that the compound criterion for one polar category is 'a and $\sim b$ and c', for example, so that the criterion for the opposite category is ' $\sim a$ and b and $\sim c$ '. In such cases, we will tend not to get the epistemic asymmetry characteristic 'privative' contrasts. (Again, epistemic asymmetry should not be confused with value asymmetry, and value asymmetry can cause epistemic asymmetry, something that will be discussed in Part III).

Polar oppositions, as I argued in Chapter 2, can be constructed from ordered series if consistent criterial contrasts are available which preserve the ordering relation. An example which, simply because of its salience and usefulness, would probably have been one of the earliest uses of oppositional taxonomic strategies for organising ordered series, is the position of the sun in the sky as a criterion for *later than* or *earlier than* within the larger cycle of time known as 'day'. The passage of the sun across the sky provides a link between a spatial ordered series and a temporal one, but further, '*later than*' can be handily preserved for larger subcategories of day by using 'between zenith and the Western horizon' ('afternoon') (is necessarily *later than*) between the Eastern horizon and zenith' (morning) (within the temporal category 'day'). The sun's position directly

overhead, then, serves criterially to subcategorise the daytime into three subcategories, morning, noon and after noon, between which the temporal order is preserved.

Now let's imagine that we are attempting to categorise objects that admit of arrangement in an ordered series. To begin with, let's imagine that every B side in John and Mary's record collection is shorter than every A side, but that all of the A sides and B sides are of the same length as each other. The longest playlist will be all A sides, and the shortest playlist will be all B sides. The next longest will be two As and one B, and the next shortest will be two Bs and one A. The A/B distinction here consistently distinguishes comparative length, and hence be used as a toggle that preserves the ordering relation *longer than* (A is longer than B). 'A' can be used, in other words, as a **criterion** for the existence of the relation '*longer than* B', and 'B' can reciprocally be used as a criterion for the existence of the relation '*shorter than* A'.

Now if we wanted to arrange our playlists in order of length, our toggles take on greater significance as criteria for position in the ordered series of playlists, a significance which can be expressed both modally and quantificationally. 'All A sides' **guarantees** that the playlist is the longest one, and 'all B sides' **guarantees** that the playlist is the shortest. The 'all A' playlist is **necessarily longer than** all other playlists in this taxonomic context, and the 'all B' playlist is **necessarily shorter than** all others in this context. Further, **every** song in the 'all A' playlist is *longer than every* song in the 'all B' playlist. Again, on this arrangement, the presence of an A side is sufficient to guarantee that the playlist is not the shortest, and the presence of a B side is sufficient to guarantee that the playlist is not the longest. Further, the series of four playlists can be divided into two subcategories, 'longer' and 'shorter', or simply 'long' and 'short' with the stipulation that any playlist in the set with at least two As is to be considered 'the longer', or 'the long' set, and any playlist with at least two Bs is 'the shorter' or 'the short' set. The significance of each of these consequences will depend on the significance of length in the particular epistemic context.

With some simple stipulations about the additivity of the value contributed by better-making properties (which are explained and discussed in Part II), stipulations

which are plausible given consistency and public communicability constraints on rational evaluation in public epistemological contexts, the above example illustrates the relations between the value opposites good and bad, or positive and negative, and the underlying comparative *better than*. A small qualification is that if there are an uneven number of categories on the scale, there will be a middle, 'indifferent' category. In the example above, the spread of criteria was such that it would be more likely that we would either take the two middle categories together as neutral with respect to length (so that the 'all A' and 'all B' categories are overt, non-exhaustive polar opposites), or dichotomously divide the scale as I suggested, so that 'all A' and 'all B' are merely extremes ('longest' and 'shortest') within opposed, exhaustive categories of 'long' and 'short'.

This model of constructing **polar scalar opposition** is crucial to understanding how we construct the good/bad, or positive/negative value contrast from the underlying value comparative *better than*, and to understanding the modal and quantificational implications of this contrast. Value and descriptive opposition are structurally identical: this and the fact that reason-based evaluations are based upon descriptive differences between objects underpins an extremely intimate relationship between value and descriptive opposition. This relationship facilitates conflation between value and descriptive opposition which can be ideologically generated and exploited. This will be the subject of discussion in Part III. In the next Part, I will directly address value opposition.

Appendix A: Ogden's 'Projectional Diagram of Opposition'
 Reproduced from C.K. Ogden (1967), *Opposition: A Linguistic and Psychological Analysis*,
 Bloomington: Indiana University Press, p 16.

