

6

Proof by refutation

Aristotle thought that 'principles' were non-demonstrable, and were to be apprehended by mental insight.¹ But there was a problem with the non-demonstrability thesis which even Aristotle had to face: there was disagreement about what the principles were. Heraclitus seemed to deny as basic a principle as the law of non-contradiction (*Met.* Γ_3 , 1005b25). Heraclitus' theories were an embarrassment to Aristotle's logical programme. On the one hand, Aristotle is prevented by his own doctrine from providing a direct proof of the law of non-contradiction. On the other hand, he is confronted with the disconcerting fact that not all people simply grasp basic principles; some go so far as to deny that they are true. In *Metaphysics* $\Gamma_{3,4}$ Aristotle sets out to resolve this dilemma, and his discussion provides insight into the nature of a justification of a basic logical law. The problem of justification is still with us. For it appears, at least initially, that if the law of non-contradiction is true, then there could be nothing more basic by means of which justification could be provided. Any purported justification would stand in at least as much need of justification as the law of non-contradiction itself.

In *Metaphysics* Γ_3 Aristotle makes the brave and seemingly reckless move of denying that anyone can believe the law of non-contradiction false. He states two conditions which are sufficient to ensure that a principle P is the 'firmest of all'. First, it must not be possible to be in error with respect to P (*Met.* Γ_3 , 1005b12). Second, P must be such that anyone who understands anything understands P (*Met.* Γ_3 , 1005b16). The law of non-contradiction is supposed to satisfy these conditions:

'For the same thing to belong and not to belong to the same thing and in the same respect is impossible (given any further specifications which might be added against the dialectical difficulties). This then is the firmest of all principles, for it fits the specification stated. For it is impossible for anyone to believe that the same thing is and is not, as some consider Heraclitus said – for it is not necessary that the

¹ Cf. *An. Post.* B19; Barnes, *Aristotle's Posterior Analytics*, pp. 248–60; J. H. Lesher, 'The meaning of $NO\hat{\Upsilon}E$ in the *Posterior Analytics*'.

things one says one should also believe. But if it is not possible for contraries to belong to the same thing simultaneously (given that we add the customary specifications to this proposition too) and the opinion contrary to an opinion is that of the contradictory, then obviously it is impossible for the same person to believe simultaneously that the same thing is and is not; for anyone who made that error would be holding contrary opinions simultaneously. That is why all those who prove go back to this opinion in the end: it is in the nature of things the principle of all other axioms also.' (*Met.* Γ3, 1005b19–34)

The law that Aristotle wishes to defend is:

(LNC) $(F)(x) \neg (Fx \ \& \ \neg Fx).$ ²

The argument is not designed to prove the law of non-contradiction, but to prove that it is impossible to disbelieve the law of non-contradiction. While there may be people, e.g. Heraclitus, who sincerely assert that the law of non-contradiction is false, Aristotle denies they can believe that. This argument sets the stage for the rest of *Metaphysics* Γ3–4. The strategy is not to try to persuade someone who does not believe the law of non-contradiction to change his mind: there is no such person to whom the attempt should be addressed.

Unfortunately this argument is problematic. Kirwan accuses Aristotle of not indicating clearly whether the argument is supposed to rule out the possibility of believing 'veiled contradictions', e.g. 'Menelaus was the king of Sparta but not of Lacedaemon.'³ However, Kirwan's criticism is unfair. For the argument is clearly intended only to rule out the possibility of self-conscious belief in two statements known to be contradictories. If it is discovered that Gx entails $\neg Fx$ then it becomes, according to Aristotle's argument, impossible to believe that Fx and Gx . But before such a discovery there is nothing in the argument designed to exclude such a conjunction of beliefs. Aristotle is not concerned to disallow the possibility of deep, unrevealed confusions. The argument is designed to refute Heraclitus' alleged thesis which presupposed that one could believe a contradiction recognized to be such.

² As Geach points out, Aristotle did not explicitly distinguish between propositional truth and the truth of predications. Since a statement, for Aristotle, was of subject-predicate form, there would be no pressing need to distinguish between propositional and predicate negation. Neither did Aristotle distinguish between the reference of a name and what a predicate applies to. See Geach, 'Aristotle on conjunctive propositions' and 'Nominalism', in *Logic Matters*, pp. 13–27, 289–91.

³ Christopher Kirwan, *Aristotle's Metaphysics, Books Γ, Δ, E*, pp. 89–90.

A second and more serious objection is that Aristotle's argument itself seems to depend on the law of non-contradiction. Aristotle assumes that it is not possible for contraries to apply to objects simultaneously and this, of course, need not be the case if the law of non-contradiction failed.⁴ Consider the following objection: Aristotle's argument begs the question for it assumes the law of non-contradiction. Aristotle's argument is supposed to show that we must believe the law of non-contradiction. But the argument assumes that the law of non-contradiction is a law of logic and this is precisely what those who claim not to believe the law of non-contradiction deny. If we recognize of two beliefs that one is a belief that Fx and the other is a belief that $\neg Fx$, then, given that we accept the law of non-contradiction, our believing that Fx will, of course, serve as a decisive objection to our believing that $\neg Fx$ (or conversely). But is not this to beg the question? For it is only because we already believe LNC that we are willing to give up one of two contradictory beliefs when we recognize them to be contradictory.

There is a dangerous ambiguity in the claim that Aristotle's argument *assumes* the law of non-contradiction. If what is meant is that the law of non-contradiction is needed as a premiss in the argument in order to secure its validity, then the claim is false. The inference from Fx to not $\neg Fx$ is valid as it stands. To someone who objects that we beg the question by assuming the law of non-contradiction, we should respond as Achilles should have responded to the Tortoise: the inference is valid as it is and does not need supplementation with a premiss that purportedly licenses the inference.⁵ We do not reject $\neg Fx$ because we have both accepted Fx and adopted the law of non-contradiction as

⁴ Of course, the crucial premiss, that 'the opinion contrary to an opinion is that of the contradictory' is not substantiated by any argument and appears in itself to be extremely dubious. Barnes has provided a defence of this suspect premiss through an investigation of the conceptual relations of belief and disbelief ('The law of contradiction'). However, Barnes' *reductio* strategy depends on directly deriving a conclusion whose contradictory is alleged to be an instance of the law of non-contradiction. Such an argument is persuasive only if the law of non-contradiction is not itself in question. Further, the justification and value of the premisses in his argument depend on the law of non-contradiction. For example, in defence of premiss (1), '(x) (x Believes ($P \& Q$) \supset x Believes P and x Believes Q)', Barnes argues that it is absurd to suppose that a man believes $P \& Q$ and does not believe Q . For, Barnes asks rhetorically, if a man does not believe Q , how could he believe P and Q ? The situation is absurd, but the absurdity derives from the fact that we take the supposition that a man may both believe Q and not believe Q to be absurd.

⁵ James Thomson, 'What the Tortoise should have said to Achilles'; Wittgenstein, *Remarks on the Foundations of Mathematics*, I, §§6-8. Here again, I am indebted to Kripke for various discussions about these arguments.

a law of logic: we reject $\neg Fx$ simply because we have accepted Fx . It is not that having adopted non-contradiction as a law of logic one will treat acceptance of Fx as decisive grounds for rejection of $\neg Fx$. Rather it is because one does count acceptance of Fx as ruling decisively against $\neg Fx$ that one can reflect on one's practice and form an abstract principle to describe it, in this case the law of non-contradiction.

If a question-begging argument is one that tries to prove a (non-self-evident) statement by means of itself, then this argument radically fails to be question-begging in that the law of non-contradiction occurs neither as a premiss nor as conclusion. For as we have seen, Aristotle's argument is not designed to prove the law, but to prove that it is impossible to disbelieve the law of non-contradiction. Aristotle's argument that it is impossible to disbelieve the law of non-contradiction depends on the law to this extent: if the law were not true then the argument would lose all its force. Aristotle readily acknowledges this dependence.

'But we have just accepted that it is impossible to be and not be simultaneously and we have shown by means of this that it is the firmest of all principles.' (*Met.* Γ4, 1006a3ff)

To admit that the argument works *by means of* the law of non-contradiction is not to admit, as Kirwan believes,⁶ that the argument depends upon LNC as a premiss. Rather it is to admit just what Aristotle believes: that our proof procedures must conform to the law of non-contradiction. In particular, the strength of the argument that it is impossible to disbelieve the law depends upon its truth. To show that the law of non-contradiction is the firmest of principles of course requires its truth: were it not true, the law could hardly be the firmest of principles.

This response indicates why Aristotle treated the laws of non-contradiction and excluded middle as 'common principles'. These laws are common because they are not premisses of argument at all, but rather principles of reason which abstractly codify aspects of our deductive inferential practice. Aristotle is clearly aware of this distinction. In *Posterior Analytics* A11 Aristotle asserts that the only proofs in which the law of non-contradiction occurs as a premiss are proofs whose conclusions are themselves instances of the law of non-contradiction (*An. Pst.* 77a10–22).⁷ Aristotle seems to argue that given a

⁶ Kirwan, *Aristotle's Metaphysics, Books Γ, Δ, E*, p. 90.

⁷ Cf. Barnes, *Aristotle's Posterior Analytics*, p. 140.

proof with an instance of the law as conclusion, one can proof-theoretically determine that one of the premisses must be an instance of the law. Similarly, Aristotle limits the use of the law of excluded middle to *per impossibile* proofs (*An. Pst.* 77a22–27). As we saw in Chapter 3, the law of excluded middle does not occur as a premiss in a *per impossibile* proof. Rather, one directly deduces a conclusion known to be impossible from two premisses one of which is known to be true, and then simply infers the contradictory of the premiss not known to be true. In fact, Aristotle would not have been able to claim that a direct and a *per impossibile* proof yield the same conclusion from the same premisses if the law of excluded middle occurred as a premiss in the *per impossibile* proof.

Frege's formalization of logic as an axiomatized system with a minimum number of rules of inference and a relatively large number of axioms, taken to be logical truths, has deeply coloured the vision of logic held by philosophers and logicians in this century.⁸ Twentieth-century interpreters of Aristotelian logic are not out of Frege's shadow – an extreme example is Łukasiewicz's formalization of the syllogistic as an axiomatic system – and the temptation to assimilate all common principles to Fregean logical truths must be resisted. One can accept that the laws of excluded middle and non-contradiction are common principles without having to accept that they occur as premisses anywhere in a proof.⁹

Still, the problems of providing a justification of as basic a logical principle as the law of non-contradiction are far from resolved. If Aristotle's argument is correct, there are no people who do not believe the law of non-contradiction, yet there may be people who sincerely *think* they do not believe it. And though they may not, strictly speaking, be able to charge Aristotle with begging the question, neither would they, when confronted with Aristotle's argument, feel any compulsion to abandon their position. For they may readily admit that *if* the law is true, then it is the firmest of principles and they must be incapable of disbelieving it. Yet what they deny is that LNC is true, and

⁸ For a critique of this type of formalization, see Dummett, *Frege: Philosophy of Language*, pp. 432–41.

⁹ Of course, some common principles should be treated as premisses. In *Posterior Analytics* A10–11, Aristotle mentions as a third example of a common principle the Euclidean common notion that equals taken from equals leave equals (*An. Pst.* 76a41, 77a31). Such a common principle is used as an axiom schema instances of which do occur as premisses in proofs. Thus Aristotle says that the Euclidean principle may occur in geometrical proofs as a premiss about equal lengths and in arithmetical proofs as a premiss about equal numbers.

they may take their own *alleged* belief in its negation as evidence that the law of non-contradiction could not be the firmest of principles.

Aristotle argues that a response must take some form other than direct proof.

'Some, owing to lack of training, actually demand that it [LNC] be proved: for it is lack of training not to recognize of which things proof ought to be sought and of which not. For in general it is impossible that there should be proof of everything, since it would go on to infinity so that not even thus would it be proof. But if there are some things of which proof ought not to be sought, they could not say what they regard as a principle more fully of that kind. But even this can be proved to be impossible in the manner of a refutation if only the disputant says something. If he says nothing, it is ridiculous to look for a statement in response to one who has a statement of nothing, in so far as he has not; such a person, in so far as he is such, is similar to a vegetable. By 'proving in the manner of a refutation' I mean something different from proving, because in proving one might be thought to beg the original [question], but if someone else is cause of such a thing it must be refutation and not proof. In response to every case of that kind the original [step] is not to ask him to state something either to be or not to be (for that might well be believed to beg what was originally at issue), but at least to signify something both to himself and to someone else; for that is necessary if he is to say anything.' (*Met. Γ4*, 1006a5-22)

Proof has its limitations. By its very nature, a proof enables one to gain knowledge of the conclusion based upon a knowledge of the premisses. But the problem is not to prove the law of non-contradiction from prior principles but to *respond* to someone who seems to be denying it. Attempting to show the incoherence of his position in the most direct manner possible, we may initially have said 'Given that you accept Fa , then it is not the case that not Fa , therefore it is not the case that (Fa and not Fa).' Our opponent charges us with begging the question, since the validity of our inference depends upon the law of non-contradiction being valid. We may not be able to offer a direct proof of the law of non-contradiction which will not be seen to beg the question.

Proof by 'refutation' is Aristotle's response to someone who charges us with begging the question in our attempt to justify the law of non-contradiction. We are not in a position to return the compliment: we cannot charge our disputant with question-begging, for he is not trying

to prove the negation of the law of non-contradiction by means of itself. What Aristotle does charge him with, however, is a covert dependence on the law of non-contradiction. Proof by refutation is designed to show that the possibility of *saying anything*, even that the law of non-contradiction is false, depends on an adherence to the law of non-contradiction. If a person is to deny the law of non-contradiction he must be in a position to do just that: assert that the law is false. There is no point, says Aristotle, in trying to argue with someone who says nothing; for in so far as he says nothing he is no better than a vegetable (*Met. Γ4*, 1006a15). But Aristotle is not arguing with a vegetable. He is arguing with someone who can present a coherent, if fallacious, argument for the falsity of the law of non-contradiction. The opponent of the law, while disowning reason, listens to reason (*Met. Γ4*, 1006a26). He is able to argue in a reasoned way against the law of non-contradiction and the possibility of such argumentation depends on adherence to the law of non-contradiction.

If someone is *to say anything* – even that the law of non-contradiction is false – he must ‘signify something’ both to himself and to others (*Met. Γ4*, 1006a21–22). Aristotle’s strategy is to show that the possibility of signifying something depends upon adherence to the law of non-contradiction. To understand the argument, an excursion into the realm of Aristotelian semantics is necessary. A sentence, for Aristotle, is a significant spoken sound, made up of expressions that themselves signify.¹⁰ Statements, those sentences capable of truth or falsity, are divided into affirmations and negations (*De Int.* 16b33, 17a8). An affirmation is a statement affirming something of something and a negation is a statement denying something of something (*De Int.* 17a25ff). These, for Aristotle, are the paradigms of a sentence: that a predicate does or does not apply to a subject.

Since in an Aristotelian statement one either affirms or denies something of a subject, at least part of the semantic role of the subject-term must be to pick out, refer to, the subject about which the affirmation or denial is being made. For an affirmation could affirm something of something only if the subject-term picked out the subject of which something is being affirmed. I would like to suggest that what an expression signifies corresponds to its semantic role: it follows that at

¹⁰ *De Int.* 16b26. Names and verbs, the components of sentences both signify. *De Int.* 16a19–21, 16b6, 16b19. See also *Categories* 1b25: the ‘things said without combination’ are the semantically significant subsentential units, ‘... each signifies either a substance or quantity or a relative or having or doing or being affected’.

least part of what it is for a subject-term to signify is for it to refer to the substance about which a predication is being made.¹¹ Aristotle makes this point (though imprecisely, owing to a failure to distinguish use and mention):

'Every substance seems to signify a certain 'this'. As regards primary substance it is indisputably true that each of them signifies a certain this; for the thing revealed is atomic and numerically one.' (*Cat.* 3b10-13)

A name of a primary substance, for example, 'Socrates' signifies the particular Socrates who, being a 'this', is individual and numerically one. Concerning natural kind terms (that is, names for secondary substances) Aristotle is more cautious (*Cat.* 3b13-21). The problem is to avoid reference to objects like Platonic Forms. Thus 'man' does not actually signify a certain 'this', even though it may appear to do so. For *man* is not an individual, as a primary substance is, but is *said of* many things.¹² However, unlike e.g. 'white', which only signifies a certain qualification, natural kind terms *signify substance* of a certain qualification (*Cat.* 3b20-21). Natural kind terms such as 'man' signify, at least in part, by referring to individual men.¹³ This theme is pursued in the theory of predication developed in *Posterior Analytics* A22. Metaphysically misleading sentences, e.g. 'The white thing is a man', are

¹¹ Of course, one must avoid attributing to Aristotle the sophisticated semantic distinctions which have been made only recently. His notion of signifying something lacks precision and will cause heartache to the modern philosopher who tries completely to assimilate it to either that of sense or reference, at least as these notions are commonly understood. For good advice on this see Miss Anscombe, 'Aristotle' in *Three Philosophers*, pp. 38-44; Robert Bolton, 'Essentialism and semantic theory in Aristotle: *Posterior Analytics* II, 7-10'. The lack of precision does not, however, impugn the suggestion that part of what it is for a subject-term to signify is to refer. Dummett has argued that there is a tension in Frege's prototype of reference, the name/bearer relation, and his conception of reference as semantic role (*Frege: Philosophy of Language*, pp. 401-29). In a *much* less sophisticated way, 'to signify' is often treated as meaning both 'to have a semantic role' and 'to refer' just because words like 'man' are treated as names.

¹² 'If something is said of a subject, both its name and its definition are necessarily predicated of the subject' (*Cat.* 2a19). The 'said of' relation holds between things and not words: it is not 'man' but man that is said of the individual man. See Ackrill, *Aristotle's Categories and De Interpretatione*, pp. 74-6, 82; Hamlyn, 'Aristotle on predication'.

¹³ Bolton, 'Essentialism and semantic theory in Aristotle: *Posterior Analytics* II, 7-10', argues that a nominal definition signifies essence without revealing it, by referring to particular instances. Thus the nominal definition of thunder is a *certain familiar noise in the clouds* (cf. *Physics* 184a16ff). Having picked out instances one can move toward a real definition by investigating the nature of anything that is essentially like those instances.

dismissed as either not predicating at all or as predicating only incidentally (*An. Pst.* 83a14–32). In genuine predications one thing is predicated of a subject and one is saying either what the subject is – e.g. ‘man is animal’ – or saying that the subject has some property – e.g. ‘man is white’ (*An. Pst.* 83a21–23). Aristotle continues:

‘Again, the things signifying a substance signify of what they are predicated of just what is that thing or just what is a particular sort of it; but the things which do not signify a substance but are said of some other underlying subject which is neither just what is that thing nor just what is a particular sort of it, are incidental, e.g. white of the man. For the man is neither just what is white nor just what is some white – but presumably animal; for a man is just what is an animal. But the things which do not signify a substance must be predicated of some underlying subject and there cannot be anything white which is not white through being something different. (For we can say goodbye to the Forms; for they are nonsense, and if they exist they are nothing to the argument; for proofs are about things of this type.)’ (*An. Pst.* 83a24–35)

To signify a substance is not only to refer to a particular substance, but also to invoke its essence. ‘Man’ is not only predicated of an individual man, but it picks him out *qua* what he is. ‘The white thing’ may refer to a man, but it does not pick him out *qua* what he is: ‘For the man is not just what is white nor just what is a certain white’ (*An. Pst.* 83a29). Substance-terms, by contrast, signify just what that thing is of which they are predicated (*An. Pst.* 83a24).¹⁴

If a man is to say anything, he must signify something both to himself and to someone else. ‘For if he does not there would be no statement for such a person either in response to himself or to anyone else’ (*Met. Γ4*, 1006a21–24). Any statement must affirm or deny something of something; and the subject term must signify the substance of which the affirmation or denial is made.¹⁵

¹⁴ The connection would be even easier to forge if an individual substance were its essence. For a defence of this thesis, see Hartman, ‘Aristotle on the identity of substance and essence’. But on the other side see Albritton, ‘Forms of particular substances in Aristotle’s *Metaphysics*’. Cf. also *An. Pst.* 14, 73b5–10.

¹⁵ That is why Aristotle’s claim that the phrase ‘goat stag’ signifies is not damaging to this interpretation. Aristotle says that the name ‘goat stag’ signifies but, because there are none, it is impossible to know what a goat stag is (*An. Pst.* B7 92b4–8). Remember, to say that an expression signifies is only to say that it has a semantic role. One can allow that the term ‘goat stag’ has a semantic role, that it signifies, without maintaining it must refer to goat stags. It would only refer to goat stags if it were a genuine substance-

'... it is clear then that this at least is itself true, that the name signifies to be or not to be this particular thing, so that it could not be that everything was thus and not thus. Again if man signifies one thing, let that be biped animal. What I mean by signifying one thing is this: if this is a man, then if anything is a man that thing will be to be a man.' (*Met.* Γ4, 1006a28–34)

If the name signifies one thing, it will do more than merely refer to an individual or individuals. If 'man' signifies one thing then any individual man will be what it is to be a man.

This interpretation is supported by Aristotle's distinction between 'signifying' one thing and 'signifying about' one thing:

"Then it is not possible that "to be a man" signifies just what "not to be a man" [signifies], if "man" signifies not only about one thing but also one thing (for we do not count as signifying one thing this, viz. signifying about one thing, since in that way "musical" and "white" and "man" would signify one thing, so that all will be one, because synonymous). And it will not be to be and not to be the same thing unless homonymously, as if others were to call not-man what we call man. But what is puzzling is not whether it is possible that the same thing should simultaneously be and not be a man in name, but in fact.' (*Met.* Γ4, 1006b13–22)

'Signify about' can be interpreted as 'be truly predicated of'.¹⁶ Aristotle's point is that even if 'man', 'white' and 'musical' could be truly predicated of some pallid lyre-player, the terms would not all signify one and the same thing. Only 'man' is a subject-term and signifies a substance, an individual man; what it is for this substance to be is to be a man. Being white or musical are properties of an individual subject, but they are properties the subject can gain or lose while remaining that subject. It is characteristic of a subject that it can undergo such change. But there are some changes a subject cannot undergo and remain that subject: a subject cannot at one time be a man and later

¹⁶ Cf. Kirwan, *Aristotle's Metaphysics, Books Γ, Δ, E*, p. 96.

term; for then its semantic role would be, at least in part, to refer to the subjects of a predication. Aristotle need not deny that 'goat stag' signifies. He is only committed to the fact that 'goat stag' cannot be the subject-term of a statement – a sentence capable of truth or falsity. For a statement affirms or denies something of something and there are no such things as goat stags of which to affirm or deny anything.

fail to be a man. For if he is a man, then that is just what it is for him to be.¹⁷

Aristotle says that if 'man' and 'musical' and 'white' signified one thing 'all will be one because synonymous' (*Met.* Γ₄ 1006b17–18). Here, one must not interpret 'synonymous' in terms of the modern concept of synonymity and mistakenly infer that what a term signifies is a statement of its meaning. For Aristotle it is not words but things which are synonymous. Two things are synonymous if they share not only a name in common, but also the 'definition of being' that corresponds to the name (*Cat.* 1a7).¹⁸ Here the 'definition of being' need not be thought of as merely verbal:¹⁹ to state that biped animal is the definition of man is not to say that the linguistic expression 'man' means 'biped animal'; rather it is to say that to be a biped animal is what it is to be a man. Similarly, if biped animal is what 'man' signifies, it is not that 'biped animal' gives the verbal definition of what 'man' means.²⁰ If 'man', 'white' and 'musical' signified one thing, then man, white and musical would share definition of being: an individual man would be just what it is to be musical and white. Aristotle says that all will be one because synonymous: this means that if things share not merely a name but the definition that corresponds to the name, then they are essentially the same thing.²¹

¹⁷ Noonan has suggested that two predicates F and G have the same signification if and only if $\Box(x) (Fx \leftrightarrow Gx)$ ('Aristotle on the principle of non-contradiction'). He then uses this analysis to contrast it with predicates signifying about one thing – i.e. predicates with the same extension. An interpretation of 1006b15ff follows. The problem with Noonan's interpretation is that while his analysis attributes a valid argument to Aristotle, it imports too much strength into the notion of signifying to achieve this end. It is not that the signification of a term is its necessary extension, but that a subject-term like 'man' signifies a substance which, while it exists, must be a man. It is the notion of substance, not signifying, which enables Aristotle to make the distinction between signifying one thing and signifying about one thing.

¹⁸ Two objects may be both homonymous and synonymous: if a name and corresponding definition applies to both objects, and a different name applies to both objects, but there is no unique corresponding definition which also does. See Ackrill, *Aristotle's Categories and De Interpretatione*, p. 71.

¹⁹ See Ackrill, *Aristotle's Categories and De Interpretatione*, pp. 71–91; Hamlyn, 'Aristotle on predication'.

²⁰ For a very different interpretation, see Dancy, *Sense and Contradiction: A Study in Aristotle* (especially p. 46). Dancy takes what a word signifies to be its sense and is thus led to make criticisms of Aristotle that I do not think are justified.

²¹ Aristotle says on a number of occasions that if contradictory predicates are true of the same thing, then everything will be one. (Cf. e.g. 1006b17, 1007a6, 1007b20.) A common interpretation of Aristotle's argument attributes to him a tacit and unjustified assumption that his opponent believes the law of non-contradiction fails quite generally. It also attributes to Aristotle a belief in the identity of indiscernibles (cf. e.g. Dancy,

'It is therefore necessary if it is true of anything to say that it is a man, that it be a biped animal (for that was what "man" signified) and if that is necessary it is not possible that the same thing should not be, at the same time, a biped animal (for to be necessary signifies this: to be impossible not to be). Therefore it is not possible that it should be simultaneously true to say that the same thing is a man and is not a man.' (*Met. Γ4*, 1006b28-34)

'Man' signifies biped animal; so we can say of anything that is a man that it is a biped animal (cf. *Cat.* 2a19). The necessity derives from the fact that 'man' signifies a substance, an individual man. What it is for him to be is to be a biped animal: so it is not possible that *he* should not be a biped animal. For if he is anything he is that. But if we cannot say of him that he is not a biped animal, we cannot say of him that he is not a man, for not-man and not-biped-animal are said of the same things.²²

This argument is persuasive only if one accepts Aristotle's view of substance. One must accept that there are, for example, individual men and that there is something which is just what it is to be a man; for example, a biped animal. For then it makes no sense to say that *it* is not a biped animal: if it is anything at all it must be a biped animal. Someone who did not believe in substance, however, need not be persuaded. Contrapositively, Aristotle accuses those who deny LNC of destroying substance:

'Those who say this entirely destroy substance and what it is to be. For it is necessary for them to maintain that all things are coincidences and there is no such thing as just what to be a man or to be an

²² Cf. *De Int.* 16a29; Ackrill, *Aristotle's Categories and De Interpretatione*, pp. 117-18.

Sense and Contradiction: A Study in Aristotle, p. 47). Since both F and $\neg F$ are supposed to apply to all x , it follows from the identity of indiscernibles that everything will be one.

There is however an alternative interpretation, based on the notion of signifying a substance, that permits an explanation of why Aristotle thought his opponent committed to the universal failure of the law of non-contradiction. Further the interpretation does not require attributing to Aristotle a belief in the identity of indiscernibles. By the law of excluded middle, $(x) (\text{man}(x) \vee \text{not-man}(x))$. 'Not-man' will be true of everything in the universe that is not a man. Suppose now that 'man' and 'not-man' signify one thing. Then since part of what it is for a subject-term to signify is to 'refer' to those objects of which it is true, it follows that $(x) (\text{man}(x) \& \text{not-man}(x))$. Further since the terms 'man' and 'not-man' signify one thing, then those things signified are signified in virtue of their being what they are. However, everything is signified by these terms. The universe will thus be essentially homogeneous.

animal [is]. For if anything is just what to be a man [is], that will not be to be a not-man or not to be a man: yet those are its denials. For what it signified was one thing and that was something's substance and to signify a thing's substance is to signify that being, for it, is nothing else.' (*Met.* Γ4, 1007a20-27)

If 'not-man' could be said of the very same individual of which 'man' is said, there could not be substance, for there would be nothing which is just what a man is. Then the possibility of discourse is destroyed for there is no subject about which to make any affirmation or denial:

'For if everything is said incidentally there will not be anything which things are initially about if coincidental always signifies a predication about a certain subject.' (*Met.* Γ4, 1007a33-b1)

But coincidental properties do coincide in a subject. The white may be musical and the musical white, but that is because they both coincide in an individual man; e.g. the talented but pallid musician (*Met.* Γ4, 1007b2-17). If coincidental properties always coincide in a subject, then any account that destroys substance must be incorrect.

'Consequently, there will be something signifying a substance even in such a case. And if that is so, it has been shown that it is impossible to predicate contradictories simultaneously.' (*Met.* Γ4, 1007b16-18)

A true opponent of the law of non-contradiction is robbed of the possibility of saying anything. For to say something, on the Aristotelian semantics, is to predicate a property of a subject. And if we attempt to say of a subject both that it is man and that it is not-man we have not succeeded in making two predications; we have failed to make one.

A serious objection to Aristotle's argument is that it assumes a particular semantical picture. A statement is assumed to be of the subject-predicate form and an affirmation is true if the predicate applies to the subject and false otherwise. The world is like a classical model of subjects and properties; it is a model that embodies the laws of classical logic. Given such a semantical picture, it does not make sense to say that a property does and does not hold of a subject. But why should a sophisticated opponent of LNC accept such a semantics? Consider, for example, Aristotle's defence of the law of excluded middle in *Metaphysics* Γ7. 'There is,' says Aristotle, 'no alteration except into opposites.' Were there a middle between 'white' and 'not-white' there would be a process of coming-to-be-white from something other than not-

white and this, says Aristotle, is not observed (*Met.* Γ7, 1011b34ff). He argues that the negation of a statement 'not-white (x)' is compatible with every state of affairs other than x being white. And since 'white (x)' holds in the one situation in which its negation does not, Aristotle argues that 'white (x) or not-white (x)' must be valid (*Met.* Γ7, 1012a15ff).

An opponent may, however, respond by rejecting the semantics, by denying that 'white' is a determinate predicate which either applies or fails to apply to every object. 'White', it may be objected, is a vague predicate: for certain objects in the domain of discourse, there may be no determinate answer as to whether they satisfy 'white' or 'not-white'. Crispin Wright has proposed the following Sorites paradox:²³ there is a series of colour patches, the first patch being obviously white and each patch visually indistinguishable from its immediate successor. Yet the last patch in the series is very dark; that is, obviously not white. Now if the opponent can convince us that 'white' is an observational predicate – that is, one for which the criteria of application are based solely on our perceptual powers – and if, as in the imagined case, there is a failure of transitivity in the relation '... is visually indistinguishable from ...' then it seems one must at least countenance the possibility that there may be cases for which there is no determinate answer as to which predicate, 'white' or 'not-white', applies.²⁴ The opponent's objection is at least *prima facie* cogent because Aristotle's semantics does not allow for the possibility of vagueness.

In the case of the law of non-contradiction, a sophisticated opponent may make an objection to Aristotelian semantics so radical that we do not find it even *prima facie* compelling. Nevertheless, it seems as if Aristotle does not even *allow* for this possibility. He argues that an opponent of LNC must eliminate substance and so there can be nothing that his statements are about. But that an opponent cannot *say anything* seems to follow only if one assumes that the correct semantical account of all statements is that a predicate applies or does not apply to a subject. The very way in which Aristotle defines a contradiction and poses an objection to the law of non-contradiction assumes an ontology of subjects about which our language speaks. In a contradiction 'the negation must deny *the same thing* as the affirmation affirmed and *of the same thing* ...' (*De Int.* 17b38). Similarly, the opponent of the law of

²³ Wright, 'Language-mastery and the Sorites paradox'.

²⁴ I am completely ignoring the intuitionist critique of the correct semantical account of non-atomic sentences.

non-contradiction as Aristotle thinks of him is not someone who completely gives up on an ontology of subjects and properties, but rather is someone who asserts the opposite of the law; that it *is* possible for the same thing to belong and not to belong simultaneously and in the same respect (*Met. Γ*₃, 1005b23). But why could not a more sophisticated opponent reject the semantics completely? Could he not hold that, since the law of non-contradiction is false, Aristotle's argument only shows that we must give up the picture of the world as composed of subjects and properties? The truth of sentences would then have to be accounted for in ways that did not invoke the existence of substance.

The response to this objection is that in Aristotle's proof by refutation a valid point is being made which transcends the semantical context in which it occurs. An assertion divides up the world: to assert that anything is the case one must exclude other possibilities. This exclusion is just what fails to occur in the absence of the law of non-contradiction, even when construed in its most general propositional form: $\neg(P \ \& \ \neg P)$. One cannot assert P and then directly proceed to assert $\neg P$: one does not succeed in making a second assertion, but only in cancelling the first assertion. This is the ultimate reason why an opponent of the law of non-contradiction cannot say anything.

'... it follows that everyone would have the truth and everyone would be in error and [the disputant] acknowledges himself to be in error. At the same time it is evident that in response to this person there is nothing for an investigation to deal with; for he says nothing. For he says neither that it is thus, nor that it is not thus, but that it is both thus and not thus; and again he also denies both these, saying that it is neither thus nor not thus.' (*Met. Γ*₄, 1008a28-33)

The opponent of the law of non-contradiction (if he is consistent) must admit not only that what he says is true, but also that what he says is in error. This seems to be the paradigm of proof by refutation: the opponent is forced to say that what he says is false.

Why, however, should this opponent be bothered? That everything he says is false does not for him rule out the possibility that everything he says is also true, which he also firmly believes. In fact he should cheerfully admit that everything he says is false – *of course* it is false – and he should chide us for not seeing that it is false (and true) as well. (Similarly with Aristotle's argument at *Met. Γ*₄, 1006b28 that it is not possible for the same thing to be a man and not be a man. Why cannot

the opponent agree that it is not possible, but also conclude that it is?) Why should the opponent object to any inference we make? Should he not accept all the inferences we accept as valid and complain only that we have not recognized all the valid inferences? (Of course, he should also say that we have recognized all the valid inferences.) Further, he may charge us with begging the question (*Met.* Γ4, 1008b1), for the objection only appears to be an objection if one accepts the law of non-contradiction.

However, Aristotle's proof by refutation has a purpose more profound than the mere attempt to extract a confession of error from his opponent. Earlier it was argued that Aristotle's argument that no one can believe a contradiction was only meant to apply to contradictions recognized to be such; it was not designed to rule out the possibility of holding contradictory beliefs that are not recognized to be contradictory. His argument is not primarily intended for the 'opponent' of the law of non-contradiction, whoever he is; it is addressed to the reader or, if you will, the back benches of the Academy. The proof by means of refutation is constructed so as to reveal *to us* that Aristotle's opponent is in a contradictory position. *Prima facie* it might appear that the revelation that one is in a contradictory position would hardly be felt as damaging to the opponent of the law of non-contradiction. But Aristotle is not trying to persuade him: the argument is for our sake, not for his. Aristotle thinks he has shown that there is no one who does not believe the law of non-contradiction. So the strategy to adopt is one designed to get *us* to see the incoherent position Aristotle's opponent is in.

This cannot be achieved merely by having him admit that he is in error. Although he admits to this we do not yet recognize the incoherence of his position. Proof by means of refutation is designed to show us that if the opponent is capable of saying anything – even if what he is capable of saying is that he is opposed to the law of non-contradiction – then his assertive and inferential practices, his general behaviour, must be in accord with the law of non-contradiction.²⁵ And when a man

²⁵ Philosophers have long argued that there can be no justification of basic deductive inferences or basic logical laws because any attempted justification will make recourse to the very inference or law one is trying to justify. Dummett has responded that one must distinguish between a *suasive* and an *explanatory* argument ("The justification of deduction"). If the task of a proof is to convince, then the epistemic direction of the argument must be the same as the consequential direction of the proof. In virtue of one's knowledge of the premisses one becomes convinced of the truth of the conclusion. With a proof used in an explanatory role, the epistemic direction may be the reverse of the consequential: knowing that the conclusion is true we may construct an argument

is sufficiently confused to assert that he does not believe in the law of non-contradiction, his general behaviour is a far better guide to his beliefs than his assertions. That he will walk to Megara rather than stay where he is when he considers that he should walk there, that he will do one thing rather than another reveals decisively that he is not the opponent of the law of non-contradiction that he thinks he is (*Met.* Γ4, 1008b12–27). Were he a true opponent he would not think Aristotle's arguments damaging, but neither would he think anything else – he would be a vegetable. Even in such a case we could not justly call him a 'true opponent' of the law of non-contradiction, for we would not be able to ascribe to him any beliefs at all. Proof by means of refutation reveals that if we can ascribe any beliefs to him, if we can interpret him as saying anything, then he must believe the law of non-contradiction, whatever sincere beliefs about his beliefs he may hold to the contrary. The opponent of the law of non-contradiction tries to argue rationally that one should not accept it. Aristotle's point is that there is no conceptual space in which such a rational discussion can occur. Argumentation is useless to persuade him to 'accept the law of non-contradiction', whatever that might mean, but his very ability to argue reveals that the alleged opponent is not genuine, even though we may have thought he was. The opponent *may* cheerfully admit that everything he says is false and, momentarily, we may even find that amusing, but after the proof by refutation we will not find it deeply interesting.

which would shed light on why it is true. The distinction between suasive and explanatory arguments provides an escape from the charge of circularity in any attempt to justify a basic deductive inference or logical law. For the man who seeks justification does not have to be persuaded that the inference is valid; he simply wishes to have its validity explained. Aristotle's proof by refutation brings the inadequacy of Dummett's position to light. The suasive appearance of *Metaphysics* Γ3, 4 can be misleading. Aristotle's Heraclitus does not seek explanation: he thinks he understands the law perfectly well and he thinks that it is false. Yet the argument is not designed to convince him – it is designed to convince us, the reader and the back benches of the Academy. This, however, does not mean that the argument need not be suasive. For there may be those among us who find Heraclitus' argument attractive. But they are not thinking clearly: the person Aristotle must convince is not someone who does not believe the law of non-contradiction, but only someone who thinks he does not believe it. Proof by means of refutation is designed to reveal to anyone who thinks he does not believe the law of non-contradiction the incoherence of his position.

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6.4 The most certain principle of being⁶⁴

It is the philosopher's task to know the basic principles of reality:

...he whose subject is being must be able to state the

⁶⁴ Appropriate reading: *Metaphysics* iv. 3–7. Some of the argument in this section is adapted from chapter 6 of *Aristotle and Logical Theory*. However, my current views about the argument have changed significantly from those expressed in that chapter.

Understanding the broad structure of reality

most certain principles of all things. This is the philosopher, and the most certain principle of all is that regarding which it is impossible to be mistaken; for such a principle must be both the best known (for all men may be mistaken about things they do not know) and non-hypothetical. For a principle which everyone must have who knows anything about being, is not a hypothesis; and that which everyone must know who knows anything, he must already have when he comes to a special study. Evidently then such a principle is the most certain of all; which principle this is, let us proceed to say. It is, *that the same attribute cannot at the same time belong and not belong to the same subject in the same respect*; we must presuppose, in face of dialectical objections, any further qualifications which might be added. This then is the most certain of all principles, since it answers to the definition given above. For it is impossible for anyone to believe the same thing to be and not to be, as some think Heraclitus says; for what a man says he does not necessarily believe. If it is impossible that contrary attributes should belong at the same time to the same subject (the usual qualifications must be presupposed in this proposition too), and if an opinion which contradicts another is contrary to it, obviously it is impossible for the same man at the same time to believe the same thing to be and not to be; for if a man were mistaken in this point he would have contrary opinions at the same time. It is for this reason that all who are carrying out a proof refer it to this as an ultimate belief; for this is naturally the starting point even for all the other axioms.⁶⁵

The most certain principle is that a property cannot both belong and not belong to a subject at the same time and in the same respect. This principle is commonly known as the *principle of non-contradiction*. Although Aristotle says that this principle is the most certain, he does not mean that we have what we would call Cartesian certainty: that by merely entertaining it in thought we will recognize its truth. Heraclitus, for example, may sincerely assert that the principle of non-contradiction is false. There are

⁶⁵ *Metaphysics* IV.3, 1005b8–34 (I use 'as' rather than the Latin *qua* and 'proof' rather than 'demonstration'.)

The most certain principle of being

two conditions which a principle must satisfy if it is to be the most certain of all. First, it must not be possible to be mistaken about it.⁶⁶ Second, anyone who understands anything understands the principle.⁶⁷ It may at first appear that these conditions do demand Cartesian certainty, but this appearance is misleading. Aristotle believes that the principle of non-contradiction satisfies these conditions, but if Heraclitus can sincerely assert that the principle of non-contradiction is false, his assertion cannot be a mistake about the principle. Nor can it reveal that he does not understand the principle. For Heraclitus clearly understands many things, so he must understand the most certain of principles. Therefore, what it is to make a mistake about the principle or to fail to understand it must be something other than sincerely to assert a falsehood about it. But how can Aristotle say that Heraclitus believes the principle of non-contradiction, that he understands it, that he cannot make a mistake about it, when he sincerely asserts that it is false?

Aristotle seems to be focussing on a deeper sense of belief than what an agent thinks he believes. Heraclitus *thinks* he believes the principle of non-contradiction is false, but Aristotle's point is that he is wrong about his own beliefs. By denying the principle of non-contradiction, Heraclitus reveals that he does not know the contents of his own mind. This idea should no longer be strange to us. The incontinent thinks that he knows that it is best for him, say, to refrain from temptation, but his action reveals that he does not have the knowledge he thinks he has. Heraclitus, by contrast, does have the knowledge he thinks he does not have. He does know that the principle of non-contradiction is true, even though he thinks he believes it false. But what notion of belief and knowledge is such that one can believe what one sincerely asserts to be false? The way to uncover this notion of belief is to study Aristotle's argument that everyone must believe the principle of non-contradiction. For his strategy is not to try to persuade someone who does not believe the principle of non-contradiction to change his mind: there is no such person to whom the argument should be addressed. The argument is designed to show us that we all – even

⁶⁶ *Metaphysics* IV.3, 1005b12.

⁶⁷ *Metaphysics* IV.3, 1005b16.

Understanding the broad structure of reality

those who deny it – really do believe the principle of non-contradiction.

It might initially appear that Aristotle's argument begs the question. For Aristotle assumes that *the belief that a certain property holds of a subject* is itself a property which is true of the person who has the belief. Beliefs are properties of believers. And, he says, the contradictory belief – that is, *the belief that the property does not hold of the subject* – is itself the contrary property of the believer. So for Heraclitus actually to believe that the same property both applied and did not apply to a given subject, contrary properties would have to be true of *him*. And, since contrary properties cannot hold of a given subject simultaneously, he cannot actually believe the principle of non-contradiction is false. Or so Aristotle thinks. But suppose Heraclitus were right: suppose the same property could both apply and fail to apply to a subject at the same time. Then there would be no reason to think that contrary properties could not be true of *him* at the same time: no reason, that is, to suppose that he could not believe that the principle of non-contradiction is false. So it seems that Aristotle's argument that everyone must believe the principle of non-contradiction depends upon the truth of the principle of non-contradiction itself.

The charge of begging the question is typically difficult to adjudicate. One usually charges an opponent with begging the question when one thinks he has assumed in his argument the very thing he should be arguing for. And yet, from the opponent's perspective the charge usually seems unfounded: directed against a basic and (to him) self-evident principle for which argument is impossible. One man's begging of the question is another man's self-evident truth.

In the case of Aristotle's argument, I think the situation is as follows. If the principle of non-contradiction is true, then Aristotle has not begged the question; if it is false, then he has. Remember, Aristotle is not trying to prove the principle of non-contradiction; he is trying to show that it is the most certain of principles. He does this by showing that everyone must believe it, no matter what they think they believe. The argument may use the principle of non-contradiction, but, far from begging the question, this is the heart of Aristotle's strategy. For he is not only inquiring into the basic structure of reality, but also trying to show that we are capable of

The most certain principle of being

making such an inquiry. Aristotle's argument establishes a basic harmony between thought and reality. Although the principle of non-contradiction is a basic principle constraining the structure of reality, it also harmoniously constrains the way we can think about the structure of reality. But what is the nature of this harmony? One might ask: is it because the principle of non-contradiction is a basic principle of *reality* that it constrains the way we must think if we are to think about reality? Or is it a principle of *intelligibility*, governing all thinking, to which the world must conform if it is to be understood? By now it should be clear that this is a false dichotomy. One of the key insights which emerged from the investigation of logic was the possibility of a structure which was at once the order of reality and the order of thought. Indeed, as we shall see, thinking constitutes reality at its highest level.⁶⁸

But if the principle of non-contradiction so permeates thought and reality, it would seem to be inevitable that one must rely on it in any argument on its behalf. Aristotle certainly recognizes that he uses it in his argument: 'We have now posited that it is impossible for anything at the same time to be and not be, and by this means have shown that this is the most indisputable of all principles.'⁶⁹ However, if the principle of non-contradiction is false, then a case can be made that Aristotle has begged the question. For the claim that a person cannot simultaneously believe that a property does and does not apply to a subject depends on the principle of non-contradiction holding with respect to that person. If the principle of non-contradiction is not generally true, it may not be true of that believer: so he may well believe that contradictory properties hold of a subject. It seems odd to suppose that whether or not an argument begs the question depends not on the structure of the argument itself, but on the truth of the claims made in the argument. We tend to think that question-begging is a failure of argument, not of truth. But that is why the charge of begging the question is difficult to adjudicate and why it is often unfair to charge one's opponent with begging the question. It may be that one has simply not yet understood what he recognizes to be a basic truth. Aristotle is confident that the principle of non-contradiction is a basic prin-

⁶⁸ See section 6.7 below.

⁶⁹ *Metaphysics* IV.4, 1006a3-4.

ciple of reality, and therefore that his argument that everyone must believe it does not beg the question.

Still, there is a problem of persuasiveness. The reason an opponent might be tempted to charge Aristotle with begging the question is that he would not find Aristotle's argument, at least as presented so far, at all persuasive. Even if Aristotle is right that his opponent only *thinks* he believes the principle of non-contradiction is false, from the opponent's (mistaken) perspective it will look as though Aristotle is simply helping himself to the truth of the principle. But should not a good argument be persuasive? Ought it not to convince people who are not already convinced? An opponent might admit that if the principle is true, then it is the most certain of principles and he must be incapable of disbelieving it. Yet he might deny that the principle is true, and he might take his own alleged belief in its falsity as evidence that the principle of non-contradiction could not be the most certain of principles. So, even if Aristotle has not begged the question, there is a serious issue about how he will be able to persuade someone of the certainty of the principle of non-contradiction.

The claim that a good argument ought to be persuasive needs to be handled with care. A good argument ought to be persuasive, but it does not follow that it ought to convince those who are not already convinced. Consider, for example, Aristotle's argument that the ethical life is the good life for man. This argument was addressed only to those who were already living an ethical life, and Aristotle assumed that, in an important sense, the argument would not be available to a bad man. That is not a fault in the argument; it is a fact about the restricted availability of the truth. Now the realm of rationality is wider than the ethical: it encompasses us all. Yet though all rational beings are subject to the principle of non-contradiction, it does not follow that all rational beings must come to appreciate this. And yet, being rational beings, we ought to be capable of appreciating the rationality of our thought. Thus the aim of Aristotle's argument is not only to make the truth of the principle of non-contradiction self-evident to us; it is to place us in a position in which we can recognize that the argument for it is itself a good argument.

Aristotle is aware that a certain dialectical finesse is required. He admits that a direct proof is the wrong strategy:

The most certain principle of being

Some indeed demand that even this [the principle of non-contradiction] shall be proved, but this they do through want of education, for not to know of what things one may demand proof, and of what one may not, argues simply want of education. For it is impossible that there should be proof of absolutely everything: there would be an infinite regress, so that there would still be no proof. But if there are things of which one should not demand proof these persons cannot say what principle they regard as more indemonstrable than the present one.

We can, however, prove negatively even that this view is impossible, if our opponent will only say something; and if he says nothing, it is absurd to attempt to reason with one who will not reason about anything, in so far as he refuses to reason. For such a man, as such, is seen already to be no better than a mere plant. Now negative proof I distinguish from proof proper, because in a proof one might be thought to be assuming what is at issue, but if another person is responsible for the assumption we shall have negative proof, not proof. The starting-point for all such argument is not the demand that our opponent shall say that something either is or is not (for this one might perhaps take to be assuming what is at issue), but that he shall say something which is significant both for himself and for another; for this is necessary, if he really is to say anything.⁷⁰

Proof has its limitations. By its very nature, a proof enables one to gain knowledge of the conclusion based upon a knowledge of the premisses. But the problem is not to prove the principle of non-contradiction from more basic principles – for there are no more basic principles – but to respond to someone who seems to be denying it. Negative proof, or proof by refutation, is Aristotle's indirect strategy for establishing the certainty of the principle of non-contradiction. Negative proof is designed to show that the possibility of saying anything, even that the principle of non-contradiction is false, depends on belief in the principle of non-contradiction. If a person is to deny the principle of non-contradiction, he must do just that: assert that the principle is

⁷⁰ *Metaphysics* IV.4, 1006a5–22.

false. There is no point, Aristotle says, in trying to argue with someone who says nothing: for insofar as he says nothing he is no better than a plant.⁷¹ But Aristotle is not arguing with a plant. He is arguing with someone who can present an understandable, if fallacious, argument for the falsity of the principle of non-contradiction. The opponent of the principle, while disowning reason, listens to reason.⁷² He is able to argue in a reasoned way against the principle of non-contradiction, and the possibility of such argumentation depends on adherence to the principle of non-contradiction.

Therefore, a person reveals his belief in the principle of non-contradiction not so much by *what* he says as by the fact that he *says* anything. His belief in the principle is revealed by the fact that he both speaks and acts in understandable ways. That is why everyone must believe the principle of non-contradiction. For, since this belief is manifested in all speech and action, if a 'person' did not believe the principle of non-contradiction, 'he' would not be able to speak or to act. But a being who has the capacity neither to speak nor to act has no claim to being a person; and so 'he' would rightly be considered as no better than a plant. The principle of non-contradiction is most certain, then, in the sense that it is absolutely unshakeable: the very possibility of speech, thought, and action depends on adherence to its truth.

If a man is to *say anything* – even that the principle of non-contradiction is false – he must say something significant both to himself and to others.⁷³ What is it to say something significant? In a statement, according to Aristotle, a person either affirms or denies something of a subject.⁷⁴ Thus the speaker must be able to *pick out or refer to* the subject about which the affirmation or denial is being made. For an affirmation can affirm something of something only if the subject-term picks out the subject of which something is being affirmed. In general, I believe that what an expression signifies corresponds *both* to what, if anything, the expression refers to *and* to its meaning.⁷⁵ An important part of what

⁷¹ *Metaphysics* IV.4, 1006a15.

⁷² *Metaphysics* IV.4, 1006a26.

⁷³ *Metaphysics* IV.4, 1006a21–2.

⁷⁴ Cf. *On Interpretation* 17a25ff; and see 16b26, 16b33, 17a8.

⁷⁵ Of course, one must avoid attributing to Aristotle the sophisticated semantic distinctions which have been made only recently. His notion of signifying some-

The most certain principle of being

it is for someone to say something significant is for him to pick out or refer to the subject about which he is going to make an affirmation or denial.⁷⁶ Since all statements are affirmations and denials of a subject, it is clearly necessary for the speaker to pick out or refer to a subject if he is going to say anything.

Now the subject of a paradigmatic Aristotelian statement will be a substance. However, to *signify a substance* is not merely to refer to it, but to refer to what it is: namely, its essence.⁷⁷ As we shall see later, Aristotle ultimately argues that primary substance is identical with its essence.⁷⁸ So simply to refer to substance is to refer to essence. But the way to think about it for the moment is that a substance-term does not just *happen* to pick out a substance – as ‘featherless biped’ might happen to pick out man; a substance-term picks out a substance in virtue of what that substance is. ‘Man,’ for example, picks out man just in virtue of what he is: ‘If *man* signifies one thing, let that be biped animal. What I mean by *signifying one thing* is this: if *this is a man*, then if *anything is a man that thing will be what being a man is*.’⁷⁹ If a subject-term signifies one thing, it will refer to something that is both substance and essence. Let us suppose that ‘biped animal’ states the essence of man, and consider the assertion

Man is [a] biped animal.

(I have put the indefinite article in brackets because Greek has no indefinite article.) On Aristotle’s theory, if ‘man’ signifies one

thing will cause heartache to the modern philosopher who tries completely to assimilate it to that of either sense or reference, at least as these notions are commonly understood. The lack of precision does not, however, impugn the suggestion that part of what it is for a subject-term to signify is to refer.

⁷⁶ As Aristotle says at *Categories* v.3b10–13, ‘Every substance seems to signify a certain “this something.” As regards primary substances it is indisputably true that each of them signifies a certain “this something”; for the thing revealed is atomic and numerically one.’

⁷⁷ See *Posterior Analytics* 1.2.2, 83a24–35.

⁷⁸ See *Metaphysics* vii.6, and section 6.6 below.

⁷⁹ *Metaphysics* iv.4, 1006a28–34 (The Oxford translation here uses the expression ‘means’ where I use ‘signify’ (for *sēmainō*). The advantage of the Oxford translation is that it makes for easier reading. The disadvantage is that, for Aristotle, ‘to signify’ is a term of art being put to technical use. There is no reason why the meaning of an expression should pick out the essence. And to say that an expression has one meaning seems to suggest nothing more than it is unambiguous. Moreover, as we shall see, the Oxford translation will find itself unable to stick with this translation. So it seems better to use the slightly artificial ‘signify’ to indicate that Aristotle has a special meaning for it.)

Understanding the broad structure of reality

thing, it refers both to the man's substance and to what man is – the essence of man. But if 'man' signifies *one* thing, the man's substance and the essence of man cannot be two distinct things to which the expression refers. The man's substance and the essence of man must be identical. The above assertion is true, then, because it is a statement of identity. *Biped animal* is not a property that is true of man, it is what man is.⁸⁰

Aristotle distinguishes *signifying one thing* from *being predicable of one subject*:

It is not impossible, then, that being a man should signify precisely not being a man, if 'man' is not only predicable of one subject but also signifies one thing (for we do not identify 'signifying one thing' with 'being predicable of one subject,' since on that assumption even 'musical' and 'white' and 'man' would have signified one thing, so that all things would have been one; for they would all have been synonymous). And it will not be possible for the same thing to be and not to be, except in virtue of an ambiguity, just as one whom we call 'man' others might call 'not-man'; but the point in question is not this, whether the same thing can at the same time be and not be a man in name, but whether it can in fact.⁸¹

Even if 'man,' 'pale,' and 'musical' could all be predicated of a single subject, these terms would not signify one thing. Only a substance-term like 'man' can signify one thing: for it picks out something that is both substance and essence.

Aristotle says that if 'man' and 'musical' and 'white' signified one thing 'all would be one because synonymous.'⁸² For Aristotle it is *things*, not words, that are synonymous. Two things are synonymous if they share not only a name in common, but also the 'logos of substance' that corresponds to the name.⁸³ Again the *logos* of substance need not be thought of as merely verbal:⁸⁴ the *logos* may be the order or arrangement which is the essence. To state that

⁸⁰ See Alan Code, 'Aristotle: Essence and Accident.' He distinguishes predications of properties a thing *has* from predications which express what a thing *is*.

⁸¹ *Metaphysics* IV.4, 1006b13–22.

⁸² *Metaphysics* IV.4, 1006b17–18.

⁸³ *Categories* 1a7.

⁸⁴ See J. L. Ackrill, *Aristotle's Categories and De Interpretatione*, pp. 71–91.

The most certain principle of being

biped animal is the *logos* of man is not to say that the linguistic expression 'man' means *biped animal*: it is to say that to be a biped animal is what it is to be a man. Similarly, if *biped animal* is what 'man' signifies, it is not that 'biped animal' gives the verbal definition of what 'man' means.⁸⁵ If 'man,' 'white,' and 'musical' signified one thing, then 'man,' 'white,' and 'musical' would share a *logos*. Aristotle says that all would be one because synonymous: this means that if things shared not merely a name but a *logos*, they would be essentially the same:

Therefore, if it is true to say of anything that it is (a) man, it must be a two-footed animal; for this was what 'man' meant; and if this is necessary, it is impossible that the same thing should not be (a) two-footed animal; for this is what 'being necessary' means – that it is impossible for the thing not to be. It is, then, impossible that it should be at the same time true to say the same thing is (a) man and is not (a) man.⁸⁶

Because Greek lacks an indefinite article, this argument can be carried out at two levels. First, we can suppress the indefinite article and take the argument to be about the substance man. Since man signifies biped animal, it is necessary that anything which can be said to be man be biped animal. For 'man' signifies its essence: and the essence is just what man is. Man cannot cease to have its essence and remain man. Second, we can insert the indefinite article and understand the argument to be about an individual man, Socrates. If it is true to say of Socrates that he is a man, then it is necessary that he be a biped animal. For since 'man' signifies biped animal, what it is for Socrates to be is to be a biped animal: so it is not possible that he should not be a biped animal. For if he is anything he is that. But if we cannot say that he is not a biped animal, we cannot say that he is not a man.

Aristotle's argument is persuasive only if one accepts his views of substance and essence. Aristotle seems to be aware of this, for he

⁸⁵ For a different interpretation, see R. M. Dancy, *Sense and Contradiction: A Study in Aristotle*, especially p. 46. Dancy takes what a word signifies to be its sense and is thus led to make criticisms that I do not think are justified.

⁸⁶ *Metaphysics* IV.4, 1006b28–34. (I have placed the indefinite article in parentheses.)

Understanding the broad structure of reality

accuses those who deny the principle of non-contradiction of destroying substance:

In general those who use this argument do away with substance and essence. For they must say that all attributes are accidents, and that there is no such thing as being essentially man or animal. For if there is to be any such thing as being essentially man this will not be being not-man or not being man (yet these are negations of it); for there was some one thing which it signified, and this was the substance of something. And signifying the substance of a thing means that the essence of the thing is nothing else.⁸⁷

If 'not-man' could be said of the very same thing of which 'man' is said, there could not be substance, for there would be nothing which was just what it is to be a man. In Aristotle's view this is tantamount to destroying the possibility of discourse, for there is no longer a subject about which to make any affirmation or denial:

But if all statements are accidental, there will be nothing primary about which they are made, if the accidental always implies predication about a subject.⁸⁸

But accidental properties are properties of a subject. The white thing may be musical and the musical thing may be white, but that is because they are both properties of a man.⁸⁹ If accidental properties are always properties of a subject, then an enduring subject is needed for any predication whatsoever. Any account, then, that destroys substance must, in Aristotle's view, be incorrect.

There must, then, even in this case be something which signifies substance. And it has been shown that, if this is so, contradictories cannot be predicated at the same time.⁹⁰

⁸⁷ *Metaphysics* IV.4, 1007a20–7. (Here the Oxford translation gives 'denoting the substance of a thing' where I continue to use 'to signify.' The translator is forced here to acknowledge the referring aspect of 'to signify,' and thus he has had to use two English expressions, 'to mean' and 'to denote,' to translate one Greek verb *sēmainō*.)

⁸⁸ *Metaphysics* IV.4, 1007a33–b1.

⁸⁹ *Metaphysics* IV.4, 1007b2–17.

⁹⁰ *Metaphysics* IV.4, 1007b16–18. (Again, I use 'to signify' where the Oxford translation uses 'to denote'.)

The most certain principle of being

A true opponent of the principle of non-contradiction is robbed of the possibility of saying anything. For to say something, on Aristotle's account of language, is to affirm or deny something of a subject. And if we attempt to say of a subject both that it is man and that it is not-man we have not succeeded in making two statements; we have failed to make one:

It follows that all would then be right and all would be in error, and our opponent himself confesses himself to be in error – And at the same time our discussion with him is evidently about nothing at all; for he says nothing. For he says neither 'yes' nor 'no', but both 'yes' and 'no'; and again he denies both of these and says 'neither yes nor no.'⁹¹

This is the ultimate reason why the opponent of the principle of non-contradiction cannot say anything. The opponent (if he is consistent) must admit not only that what he says is true, but also that what he says is in error. This seems to be the paradigm of proof by refutation: the opponent is forced to say that what he says is false.

Why, however, should this opponent be worried? That everything he says is false does not for him rule out the possibility that everything he says is also true, which he also firmly believes. In fact he should cheerfully admit that everything he says is false – of course it is false – and he should chide us for not seeing that it is false (and true) as well. Similarly with Aristotle's argument that it is not possible for the same thing to be a man and not be a man.⁹² Why cannot the opponent agree that it is not possible, but also conclude that it is? Why should the opponent object to any inference we make? Should he not accept all the inferences we accept, and complain only that we have not recognized all the valid inferences? (Of course, he should also say that we have!) Indeed, why can this opponent not accept Aristotle's entire argument, and complain only that he has not recognized the other side of the story? He may even charge Aristotle with begging the question, for Aristotle's argument only appears to be an objection to his position if one already accepts the principle of non-contradiction.

However, Aristotle's proof by refutation has a purpose more

⁹¹ *Metaphysics* IV.4, 1008a28–33.

⁹² *Metaphysics* IV.4, 1006b28; see above.

profound than the mere attempt to extract a confession of error from such a slippery opponent. His argument is not primarily intended for the 'opponent' of the principle of non-contradiction, whoever he is; it is addressed to the reader. The proof by means of refutation is constructed so as to reveal to us that Aristotle's opponent is in a contradictory position. At first it might appear that the revelation that one is in a contradictory position would hardly be felt as damaging to the opponent of the principle of non-contradiction. But Aristotle is not trying to persuade him: the argument is for our sake, not for his. Aristotle thinks that there is no one who does not believe the principle of non-contradiction. So the strategy to adopt is one designed to get us to see the incoherent position Aristotle's opponent is in.

This cannot be achieved merely by having him admit that he is in error. Although he admits to this, we do not yet recognize the incoherence of his position. Proof by means of refutation is designed to show us that if the opponent is capable of saying anything – even if what he is capable of saying is that he is opposed to the principle of non-contradiction – then his assertive and inferential practices, his general behavior, must be in accord with the principle of non-contradiction. And when a man is sufficiently confused to assert that he does not believe the principle, his general behavior is a far better guide to his beliefs than his assertions. That he will walk to Megara rather than stay where he is when he considers that he should walk there, that he will do one thing rather than another, reveals decisively that he is not the opponent of the principle that he thinks he is.⁹³ Were he a true opponent he would not think Aristotle's arguments damaging, but neither would he think anything else – he would be a vegetable. Even in such a case we could not justly call him a 'true opponent' of the principle of non-contradiction, for we would not be able to ascribe to him any beliefs at all. The opponent of the principle of non-contradiction tries to argue rationally that one should not accept it. Aristotle's point is that there is no conceptual space in which such a rational discussion can occur. Argument is useless to persuade him to 'accept the principle of non-contradiction,' whatever that might mean, but his very ability to argue reveals that the alleged opponent is not genuine, even though we may have thought he was. The opponent

⁹³ *Metaphysics* IV.4, 1008b12–27.

The most certain principle of being

may cheerfully admit that everything he says is false, and, momentarily, we may find that amusing and challenging, but after the proof by refutation we should not find it deeply interesting.

A more serious objection to Aristotle's proof by refutation is that it depends on his theory of substance and essence. Is that not a major weakness in his argument? For it is overwhelmingly likely that the opponent who claims to disbelieve the principle of non-contradiction would also disbelieve Aristotle's theory of substance and essence. The opponent might also dispute Aristotle's philosophy of language. Aristotle argues that an opponent of the principle of non-contradiction must eliminate substance, so that there can be nothing that his statements are about. But that an opponent cannot *say anything* follows only if one assumes that the correct account of language-use is the one Aristotle gives: that to say anything is to affirm or deny something of a subject. Indeed, the very way in which Aristotle defines a contradiction and poses an objection to the principle of non-contradiction assumes an ontology of things about which our language speaks. In a contradiction 'the negation must deny the same thing as the affirmation affirmed and of the same thing ...'⁹⁴ Similarly, the opponent of the principle of non-contradiction as Aristotle thinks of him is not someone who completely gives up an ontology of substances and properties, but rather someone who asserts the opposite of the principle: that it is possible for the same thing to belong and not to belong to a subject simultaneously and in the same respect.⁹⁵ But why could not a more sophisticated opponent completely reject this world-view and theory of language? Could he not hold that, since the principle of non-contradiction is false, Aristotle's argument only shows that we must give up the picture of the world as composed of substances and properties? The truth of sentences would then have to be accounted for in ways that did not invoke the existence of substance.

In the grip of this objection, one might wonder why Aristotle did not formulate a more abstract argument, one which is independent of his particular theory of substance. Certainly, he had an argument immediately to hand. For within the details of his proof by refutation a valid point is being made which transcends both his

⁹⁴ *On Interpretation* VII, 17b38.

⁹⁵ *Metaphysics* IV.3, 1005b23.

Understanding the broad structure of reality

theory of substance and his philosophy of language. An assertion divides up the world: to assert that anything is the case one must exclude other possibilities. This exclusion is just what fails to occur in the absence of the principle of non-contradiction, even when it is construed in its most general form:

for any statement S, it is not the case that both S and not-S.

One cannot assert S and then directly proceed to assert not-S: one does not succeed in making a second assertion, but only in canceling the first assertion. This argument does not depend on any theory of substance or on any theory of the internal structure or semantics of statements. It is a completely general point about the affirmation and denial of statements. Why, then, did Aristotle not focus on such a general argument if he wanted to make his proof as strong as possible?

If this objection looks strong, it is because one has lost sight of Aristotle's project. Aristotle's goal is neither to prove the principle of non-contradiction nor to convince an opponent of the principle to change his mind: in Aristotle's view, there is no such opponent. What Aristotle is trying to do is to show how the structure of reality constrains the structure of our thought. The very fact that the world is constituted of substances and properties forces us to think, speak, and act in certain ways. In a world made up of substances, any thinker must be someone who believes the principle of non-contradiction. It is because the structure of our thought is responsive to – indeed, expressive of – the structure of reality that we thinkers are capable of conducting a very general inquiry into reality. Since substance is the basis of reality, we thinkers are capable of conducting a general inquiry into substance. That is, we are capable of being philosophers engaged in metaphysical inquiry.

The next step in Aristotle's progress is to show that substance is identical with essence. For if substance is identical with essence, inquiry into substance cannot be a study of a subject-matter which is distinct from the inquiry itself. For, as we have seen, when mind inquires into essence it becomes the very essence it is contemplating. It is only when Aristotle has shown that substance is essence that he finally establishes metaphysics as an inquiry in which sub-

What is substance?

ject and object of study are identical. This is one of the central tasks of the central books of Aristotle's *Metaphysics*.