

## Anti-Realism, Scepticism and the Limits of Sense

*Christopher Norris*

### I

Michael Dummett has been occupied over the past four decades in exploring, refining, and (mostly) defending an anti-realist approach to various fields of knowledge or branches of enquiry.<sup>1</sup> Anti-realism, on Dummett's account, is defined chiefly in negative terms, i.e., by its denial of certain theses that he takes to characterise the realist position. For the realist there is a large class of statements whose truth-value is strictly undecidable since it lies beyond our utmost powers of verification or falsification yet concerning which we can rightfully assert that they must be *either* true *or* false – objectively so – despite our lack of knowledge concerning them. What decides that value is the way things stand in reality, that is, the existence of certain *truth-makers* (facts, circumstances, real-world [including historical] events, mathematical or other such abstract verities) to which those statements correspond in their role as *truth-bearers*. Truth is conceived as recognition-transcendent in the sense that it depends not at all on the scope and limits of our cognitive or epistemic powers. For the anti-realist, conversely, any truth-apt statement has to meet the condition that its truth-value can be specified in terms of some available proof-procedure or method of verification. To suppose otherwise is to believe – nonsensically – that we could somehow acquire or manifest a grasp of what it takes for that statement to be true (or false) while lacking just the kind of knowledge required to decide the issue either way. In which case we should think of truth as 'epistemically constrained', or of statements as possessing a truth-value only in so far as we can (or at any rate could in principle) find it out by some investigative means. The realist must therefore be deluded – metaphysically out on a limb – if he or she asserts the existence of truths that would lie beyond our utmost cognitive, epistemic, or probative reach.

Dummett's other chief claim to originality is to have clarified this whole debate by posing it in logico-linguistic terms or by placing it on ground that has been worked over most thoroughly by philosophers of logic and language in the post-Fregean line of descent. Thus, as he wrote in 1978, '[t]he whole point of my approach . . . has been to show that the theory of meaning underlies metaphysics. If I have made any worthwhile contribution to philosophy, I think it must lie in having raised the issue in these terms'.<sup>2</sup> And again, in a retrospective piece some fifteen years later on:

[t]he opinion is sometimes expressed that I succeeded in opening up a genuine philosophical problem, or range of problems, but that the resulting topic has little to do with traditional disputes concerning realism. That was certainly not my intention: I meant to apply a new technique to such wholly traditional questions as realism about the external world and about the mental, questions which I continue to believe I characterised correctly.<sup>3</sup>

'Correctly' is somewhat ambiguous here as between 'getting the issue into a more perspicuous focus without any bias either way' (Dummett's professedly neutral or even-handed line of approach) and 'presenting that issue so as to highlight the problems with realism' (which is how that approach most often works out in particular contexts of debate). For the regular upshot of Dummett's analyses is to cast

the realist as defender of an over-committed metaphysical doctrine and hence to treat antirealism as the default option for anyone who would wisely seek to shuck off such excess philosophic baggage. Where the realist errs is in supposing that we could ever conceive the existence of truths that surpassed our best powers of ascertainment. This follows – so he argues – from certain crucial considerations about the operative scope and limits of human understanding as embodied in our various, linguistically articulated means of acquiring and manifesting such truths. What thus becomes plain is the sheer impossibility that our truth-predicates might have some valid application to statements for which we lack any adequate proof-procedure or means of verification, yet whose well-formedness leads us to think that they *must* be either true or false – objectively so – quite apart from such issues of epistemic warrant.

This applies just as much to logic, mathematics, and the formal sciences as to areas of investigation (such as physics or history) where the relevant constraints are chiefly those of empirical or evidential warrant. Thus for instance, as regards mathematics, Dummett adopts an intuitionist approach according to which provability (not objective truth) is the sole criterion and we are therefore wrong to claim of any well-formed yet so far unproven theorem or conjecture that it *must* be either true or false despite its undecidability by the best means at our disposal.<sup>4</sup> To this extent Dummett follows Frege and the later Wittgenstein – albeit with certain express reservations – in arriving at his anti-realist position on issues in the philosophy of language and logic. What he takes from Wittgenstein is a generalisation of Frege's 'context principle', that is, the idea that terms can only have meaning in the context of some given proposition, and hence – extending this principle – that the meaning of that same proposition can itself be construed only with reference to the conditions of verifiability which apply to propositions of just that type within a certain area of discourse.<sup>5</sup>

There is a tension in Dummett's argument here since he rejects any radically holistic or contextualist theory of meaning on the grounds that it cannot explain how we could ever acquire or manifest a grasp of this or that particular proposition, as would seem prerequisite for our coming to understand its role within any such wider context. Thus Dummett declares very firmly in favour of a logico-semantic approach based on the principle of compositionality, i.e., the principle that sentence-meaning can be specified in terms of those various component parts (subjects, predicates, logical connectives, etc.) that between them serve to identify its sense and reference. All the same Dummett's anti-realism can be seen to push a long way in that other, more extreme contextualist direction since it entails the idea that statements can be taken as meaningful or truth-apt (more precisely: as candidates for 'warranted assertibility') only on condition that they play some role in our shared practices or accepted methods of proof and verification. On this view – to repeat – we could never be justified in asserting with regard to some particular statement that it *must* be either true or false as a matter of objective (i.e., verification-transcendent) fact even though we lack the evidential means to ascertain its truth-value.

For if indeed it is the case, as Dummett argues, that assertoric warrant extends just so far as the range of statements for which we possess – or might come to possess – decisive evidence either way, then objectivist talk of truth or falsehood is simply offbounds for statements of the so-called 'disputed class', i.e., those that are undecidable to the best of our knowledge. Rather such statements are neither-true-nor-

false since they exceed the scope of warranted assertibility as defined by criteria which cannot but be those of shared understanding – whether within some relatively wide or relatively specialised community – with regard to what should properly count as an instance of proof or verification.

Dummett has two chief arguments to this effect, both of them taken (by himself and others) as central to the anti-realist case. The 'acquisition argument' maintains (after Wittgenstein) that warranted assertibility is a matter of our learning to apply the relevant criteria within this or that linguistic-communicative context, while the 'manifestation argument' further requires – again after Wittgenstein – that we show ourselves competent to exercise that grasp by engaging in various communally recognised forms of behaviour, expression, or rule-governed practice.

On both counts, therefore, it cannot make sense to posit the existence of truths that lie beyond our capacity to produce evidence for them, evidence which qualifies as such according to the norms of assertoric warrant that define the scope and limits of attainable knowledge. At this point one should perhaps acknowledge that Dummett sets out on his own submission not so much to argue the case for anti-realism as to test its applicability – along with that of the rival (realist) hypothesis – across different areas of discourse. All the same one may reasonably doubt these claims of neutrality or even-handedness when set against Dummett's very evident bias in favour of anti-realism, that is to say, his frank inability to conceive what the realist could possibly *mean* by upholding the existence of objective truth-values for unprovable hypotheses or statements belonging to the disputed class. 'For the anti-realist', he remarks, 'an understanding of [any] statement consists in knowing what counts as adequate evidence for the assertion of the statement, and the truth of the statement can consist only in the existence of such evidence'.<sup>6</sup> From which it follows necessarily – on Dummett's account – that '[t]he notion of truth, when it is introduced, must be explained, in some manner, in terms of our capacity to recognise statements as true, and not in terms of a condition which transcends human capacities'.

Thus in his view it is self-contradictory to claim – as if we could somehow *know* this to be the case – that there exist certain truths for which we lack any means of verification or whose truth-value is beyond the grasp of creatures such as ourselves with our particular range of sensory inputs, perceptual modes, cognitive powers, capacities of formal reasoning, and so forth. In which case statements of the 'disputed class' are exceptions to the logical law of bivalence which holds that they must be *either* true *or* false regardless of whether we are now (or might ever be) so placed as to decide the issue. On the contrary: such statements must be taken not only as neither true nor false to the best of our knowledge but as neither true nor false *sans phrase*. Thus Goldbach's conjecture (that every even number is the sum of two primes) may well have been tested up to huge numerical values on the most powerful computer programmes and may also possess the utmost degree of intuitive conviction but must still – since lacking any formal proof – be counted neither true nor false.<sup>7</sup> Or again, take the case of a speculative astrophysical statement such as: 'There exists a duplicate solar system in some epistemically inaccessible region of the expanding universe' (i.e., too remote and receding too fast for its electro-magnetic signals to reach our terrestrial radio telescopes).<sup>8</sup> Here again, according to Dummett, we shall breach the requirement of warranted assertibility – and lapse into incoherence – if we say: 'Well, the statement is either true or false as a matter of objective fact even though we

earthlings will never find out barring some (at present) inconceivable advance in our means of observation’.

This latter example brings out the kinship between Dummett’s logico-semantic version of the anti-realist case and the stance adopted by verificationists in epistemology and philosophy of science. On their view we cannot be justified in venturing beyond the best empirical evidence and asserting the existence – the objective reality – of certain items (such as remote galaxies or elusive subatomic particles) whose role in our present-best scientific theories licences at most a non-committal attitude in that regard.<sup>9</sup> This position – first adopted by the great nineteenth-century physicist Ernst Mach with regard to the existence of atoms – has lately received a powerful re-statement under the title ‘constructive empiricism’ by Bas van Fraassen.<sup>10</sup> Its affinity with Dummett’s line of argument comes out very clearly when van Fraassen contrasts his own outlook in matters scientific and philosophical with that of his (presumptively misguided) realist opponent. For the latter, he writes, ‘science aims to give us, in its theories, a literally true story of what the world is like; and acceptance of a scientific theory involves the belief that it is true’.<sup>11</sup>

For the constructive empiricist, on the other hand, ‘science aims to give us theories which are empirically adequate;<sup>12</sup> and acceptance of a theory involves a belief only that it is empirically adequate’. Where van Fraassen most strikingly differs with Dummett is in making no pretence of judicious even-handedness as between these two doctrines and adopting a strong, even (at times) a downright contemptuous attitude toward the former. Thus scientific realism invites the charge of ‘empty strutting and posturing’, of putting up a false ‘display of courage not under fire’, and moreover of ‘avow[ing] additional resources that cannot feel the pinch of misfortune any earlier’.<sup>13</sup> This is because, as van Fraassen sees it, realism *claims* to ‘answer more questions’ and to give us a ‘richer, fuller picture of the world’ while in fact doing no such thing (since based upon just the same range of empirical evidence) and moreover taking no additional risks (since subject to just the same chances of empirical disconfirmation).

Hence the odd tone of prosecuting zeal – even of moral repugnance – that tends to overtake van Fraassen’s otherwise equable and good-humoured prose when the realist opposition comes into view. Perhaps it may also be explained in part by the range and force of those various counter-arguments that are marshalled against his position. It is most often challenged in current debate by the advocates of ‘convergent realism’ and ‘inference to the best explanation’, both of which claim to mount a strong rebuttal (if not a logical refutation) of the antirealist case.<sup>14</sup> On their account realism is a theory with its own well-established scientific credentials, and one that can be tested in just the same way that first-order scientific theories are tested, i.e., through its managing or failing to provide the best, most rational explanation of how and why various branches of science have produced such a likewise well-established range of descriptive, predictive, and causal-explanatory hypotheses.

All this evidence must count for nothing – so the argument goes – if we follow van Fraassen and adopt a ‘strong’ constructive-empiricist approach that refuses to credit the existence of entities (whether subatomic particles or light-bending galaxies with massive gravitational fields) beyond our best means of direct, unaided, or

technologically unassisted observation. However we shall then be able to adduce no plausible account of how science has typically advanced through the stages of (1) pure speculation with regard to (e.g.) the existence of atoms, (2) theoretically-supported conjectures wherein they acquire a crucial explanatory role, and (3) the advent of new, more powerful or refined technologies whereby they can either be observed or manipulated, as is the case with atoms nowadays.<sup>15</sup> Besides, there is something grossly anthropocentric about van Fraassen's idea that the limits of unaided *human* observation (more precisely: the limits of what we can observe through 'basic' instruments such as optical microscopes and telescopes rather than advanced instruments like electron microscopes and radio telescopes) should somehow decide what properly counts as an item of physical reality.<sup>16</sup>

Thus the realist will remark how much more accurate and powerful are these latest technologies; that we understand their workings well enough to make due allowance for any inbuilt distorting or disturbance effects; and – not least – how van Fraassen's appeal to unaided (or 'naked') observation ignores the sheer amount of perceptual and cognitive processing that goes on between the impact of photons on our retina and the experience of visual images.<sup>17</sup>

Also (just to drive the point home) it is a strange theory which obliges its holder to maintain that some remote celestial body may be taken as real just so long as an astronaut could get close up enough to observe it 'directly' through her spacecraft window – or perhaps through a crude optical telescope – while relinquishing that claim (and figuring merely as a product of empirical convenience) if observed from earth by the most sophisticated means at our present disposal. All of which arguments the realist will take as bearing out her case for scientific realism as a matter of inference to the best (most rational) explanation.

Needless to say, the constructive empiricist will remain staunchly unimpressed by such objections, just as the Dummettian anti-realist will see no force to any counter-claim that the existence of objective (recognition-transcendent) truths is a precondition for our grasp of what constitutes knowledge and progress in mathematics, the physical sciences, and other regions of enquiry.

Thus the argument for convergent realism – that terms in a mature scientific theory 'typically refer' and that the laws in such a theory are 'typically approximately true' – will strike the constructive empiricist as a mere fudging of the issue, and besides, as ignoring the sheer range of candidate items (phlogiston, caloric, the luminiferous ether, the planet Vulcan, etc.) which once appeared to meet exactly those requirements but have now passed into the history of discredited scientific lore.<sup>18</sup> To which the convergent realist may respond by pointing out that this 'sceptical meta-induction' (or generalised 'argument from error') plainly fails to work since it presupposes what it sets out to deny, i.e., the fact that our knowledge has advanced to a stage where we can confidently say of such terms – and any putative laws associated with them – that they are empty or nonreferring.<sup>19</sup> Also there is the more nuanced version of this argument which distinguishes between totally obsolete theories (like those involving 'phlogiston' or 'the planet Vulcan') and theories which, although strictly false, can be seen to have paved the way for subsequent developments that still hold a place in our current-best scientific thinking. Such would be the case as regards Black's 'caloric' hypothesis since it led on to the theory of specific heat, and

likewise as regards the ‘luminiferous ether’ since – with a somewhat greater stretch of charitable hindsight – we can take it as referring to something very like Maxwell’s electro-magnetic field.<sup>20</sup> However, as I have said, these realist rejoinders will cut no ice with the anti-realist or constructive empiricist for whom they will appear just a kind of metaphysical extravagance, that is to say, a needless (and explanatorily vacuous) yielding of hostages to future scientific fortune.

## II

I should not wish to give the impression that Dummettian antirealism and van Fraassen-type constructive empiricism are two variants on the same sceptical theme, or that they don’t involve significant differences of argument and emphasis. Dummett’s is in one sense a more cautious verificationist approach, arguing its case on primarily linguistic (or logico-semantic) grounds and rejecting – or at any rate purporting to reject – any fixed anti-realist *parti pris* as concerns some particular area of discourse. To this extent it contrasts with van Fraassen’s doctrinaire insistence on the folly or the false display of ‘courage not under fire’ indulged by realists who in truth risk nothing more than straightforward, honest empiricists should their theories at length prove wrong or their putative referents (like ‘phlogiston’ or ‘Vulcan’) turn out not to exist. On the other hand there is something of mock humility about Dummett’s claim to be merely trying out the rival (realist and anti-realist) hypotheses across a range of areas – from mathematics to morals – with no preconceptions either way. For if taken at anything like full strength (as it often demands to be taken) then Dummett’s logico-semantic approach goes much further toward undermining certain basic realist or objectivist conceptions than does van Fraassen’s relatively specialised focus on issues in philosophy of science. This difference comes out with particular force when Dummett declares – on precisely such logico-semantic grounds – that any ‘gaps in our knowledge’ must also be construed as ‘gaps in reality’, i.e., that if we lack sufficient evidence or a reliable means of verification for some given (e.g., historical) statement then *ex hypothesi* that statement possesses no determinate truth-value and is hence referentially void.

This idea is troublesome for Dummett since he knows very well – as one whose moral and political convictions have led to him to engage actively in campaigns against racist movements like the National Front – that such thinking might fall in with the purposes of right-wing revisionist historiography or even such flagrant abuses as Holocaust-denial.<sup>21</sup> After all, if his argument goes through then it is a fallacy to hold that there are certain claims about the past whose veridical status is a matter of objective (verification-transcendent) truth and which could therefore in no way be affected by any change in our state of knowledge, e.g., by the loss or destruction of evidence or by some large-scale, highly successful programme of ideological brainwashing. The issue is somewhat complicated here by Dummett’s frequent suggestion that anti-realism is the best (indeed only) way to keep a grip on such facts since it offers an alternative to the realist’s scepticism-inducing idea that truth can always come completely apart from our evidential sources or means of verification. Thus:

[r]ealism about the past entails that there are numerous true propositions forever in principle unknowable. The effects of a past event may simply dissipate . . . . To the realist, this is just part of the human condition; the anti-

realist feels unknowability in principle to be simply intolerable and prefers to view our evidence for and memory of the past as constitutive of it. For him, there cannot be a past fact no evidence of which exists to be discovered, because it is the existence of such evidence that would make it a fact, if it were one.<sup>22</sup>

However this passage shows very clearly that anti-realism, so far from preserving a reliable link between present knowledge and the truth of past events, in fact cuts in just the opposite direction since it renders such ‘truth’ entirely dependent on various contingent factors including the survival of documentary sources or their having come down to us without suppression or ideological tampering. Thus when the realist takes it as ‘just part of the human condition’ that ‘the effects of a past event may simply dissipate’ she is not for one moment suggesting that *past events themselves* – or the truth-value of our statements concerning them – must likewise be thought subject to attrition through factors such as cultural memory-loss or destruction (whether by accident or design) of the relevant information sources. On the contrary: her point is that such statements – including those of the Dummettian ‘disputed’ (well-formed though undecidable) class – have their truth-value fixed objectively by what *did or did not occur* as a matter of historical fact and quite apart from any gaps, lacunae, or distortions in the documentary record. This places her in sharp opposition to the anti-realist for whom ‘unknowability in principle’ is felt to be ‘simply intolerable’ because it leads us to suppose that there may be truths now or forever beyond our epistemic ken.

Hence Dummett’s (on the face of it) quite remarkable statement that, to this way of thinking, ‘there cannot be a past fact no evidence of which exists to be discovered, because it is the existence of such evidence that would make it a fact, if it were one’.<sup>23</sup> To be sure, there is some room for debate as to just how far this statement goes in a radically anti-realist direction, i.e., toward claiming that the *truth about* – rather than merely our knowledge concerning – past events is a matter of our best available evidence for them. After all, many philosophers nowadays would reject the view – most famously held by Bertrand Russell – that ‘facts’ are objects (or complexes of objects and properties) which exist ‘out there’ in the world and which render our statements true or false to the extent that those statements succeed or fail in corresponding to the relevant facts.<sup>24</sup>

Thus it is often remarked – following the widespread ‘linguistic turn’ whose sources include Frege, late Wittgenstein, and of course Dummett himself – that facts exist only in and through language (i.e., as articulate statements of this or that kind), and hence that any talk of ‘correspondence’ between statements and facts is at best redundant and at worst downright nonsensical.<sup>25</sup> So one might just construe Dummett as making the more moderate antirealist, indeed (in a sense) realism-compatible claim that our linguistically articulated *knowledge* of ‘the facts’ is epistemically constrained or subject to the scope and limits of evidential warrant. Yet this moderate interpretation cannot stand up when set against Dummett’s further remark that the anti-realist’s refusal to tolerate ‘unknowability in principle’ must incline him or her ‘to view our evidence for and memory of the past as constitutive of it’.

For unless Dummett has carelessly misspoken himself here – omitted to add some crucial qualifying clause – then clearly it is ‘the past’ (past events themselves rather

than our knowledge of them) that should be thought of as somehow *constituted by* whatever evidence lies presently to hand or whatever we are able to retrieve from the data of collective or individual memory. In which case Dummettian anti-realism must be seen to push the linguistic turn to a point where it entails the radical dependence not only of ‘the facts’ (linguistically conceived) on our state of knowledge concerning them but also of historical truth *per se* on those same ‘facts’ as recorded, recollected, or evidenced to the best of our ability. And it is then hard to see – on this somewhat disconcerting though textually warranted version of the claim – how Dummett’s argument could well stop short of endorsing the idea that present (or future) changes in the nature of our evidence might retroactively affect the occurrence, non-occurrence, or outcome of some past event.

As I have said, Dummett is keenly aware of the affront to all our standing philosophical (as well as everyday-common-sense) convictions represented by this line of thought. Also there are strong counterarguments – such as that from the existence of ‘truth-value links’ between past and present – which would seem to give adequate reason for rejecting the idea that any truth of the matter with regard to historical events must be thought of as dependent on our still having access to the same range of evidence as fell within the ken of well-placed observers at the time. These arguments involve the simple device of taking some given statement and supposing it to be spoken at different times with reference back and forth between its differently tensed (but logically equivalent since strictly interchangeable) truth-conditions.<sup>26</sup> Thus, for instance, any statement to the effect ‘There was a thunderstorm in Cardiff on April 9th 1987’ is true today if and only if ‘There is thunderstorm happening right now’ was true at some time during April 9th 1987. And likewise, any statement uttered on April 9th 1987 to the effect ‘There will a thunder-storm on September 1st 2003’ will itself have been true if and only if the statement ‘There is a thunder-storm happening right now’ is true at some time during September 1st 2003. In which case, it would seem, the anti-realist must be hard put to sustain his thesis in the face of a realist counter-argument which assumes nothing more than the kind of consistency that anyone – whatever their particular views on this question – must surely accept on pain of embracing a straightforward logical absurdity.

Bernard Williams makes a kindred point when he discusses the relationship between myth and history in ancient Greek thought and the way that this relationship can be seen to have changed during the period from Herodotus to Thucydides.<sup>27</sup> What emerged was a new conception of objective time that tended increasingly to separate out these two modalities of discourse and apply more stringent criteria of truth to the various sources – material evidence, documentary (written) reports, first, second or nth-hand oral testimony, folk-memory, ‘once-upon-a-time’ allusions to a past age of gods and legendary heroes, etc. – which the historian was now called upon to pass in critical review.

Williams cites the well-known passage from Thucydides’ opening chapter where he impugns the veracity of poets such as Hesiod who conflated mythic with (pseudo-) historical narrative and also of those ‘logographers’ – Herodotus presumably among them – who failed to draw such distinctions with adequate rigour.<sup>28</sup> This critique carries a strong implication that there is no room within historical discourse, strictly speaking, for the kinds of ‘indeterminate’ person or event whose existence or occurrence had hitherto occupied a temporally distant twilight zone concerning which



chroniclers had felt no need to decide whether (say) Minos, legendary King of Crete, was a god or a human being, and whether his exploits belonged to the realm of a historical myth or demythologised history. What enables this transition is the advent of a new, more objective concept of time whereby people learn to extrapolate from their immediate (intuitive or experiential) grasp of past, present, and future to a longer-term sense of the temporal relations – or the truth-value links – which constitute the historical domain. In Williams' words:

We become conscious of our being, in temporal terms, some people among others, and with this comes the idea that some of our past was other people's present, that our present was other people's future, and so on; in particular, that what for us, now, is the remote past, for past people was the recent past or the present . . . . [Thus] it has to be recognised that one cannot implicitly treat the remoter past as a peculiar area in which indeterminate happenings and people could exist. If one can say only indeterminate things about them, then that is a matter of our relation to them. Either there was no time at which they existed, so they did not exist at all, and are mere stories; or they were as real, and as determinate in their time as similar things are in ours, and we simply do not know enough about them.<sup>29</sup>

I have cited this passage at length partly because – in conjunction with Williams' remarks about Herodotus and Thucydides – it puts historical flesh on the formal argument from truth-value links, and partly because it stands in such sharp contrast to Dummett's understanding of these matters. The anti-realist, we recall, 'feels unknowability in principle to be simply intolerable' and thus prefers 'to view our evidence for and memory of the past as constitutive of it'. For him, moreover, 'there cannot be a past fact no evidence of which exists to be discovered, because it is the existence of such evidence that would make it a fact, if it were one'.<sup>30</sup>

Williams makes no explicit reference to Dummettian anti-realism in this particular context. However one can see that their arguments are opposed point-for-point on all the relevant issues, including what Williams regards as the progress that came about when historians acquired an objective conception of time and – in direct consequence of that – an objectivist (truth-based and critical) conception of their own subjectdomain. After all, 'once we accept the idea of historical time, it is quite clear that the gods are essentially indeterminate, in many respects, and could have no fixed or clear relations to it'.<sup>31</sup> In which case there is a sharp distinction to be drawn between such 'indeterminate' (since mythic or temporally unlocated) beings and those 'gaps in reality' which, according to Dummett, result from 'gaps in our knowledge'. Where the latter claim is plausible only in so far as one renounces any notion of objective historical truth the former makes sense only on condition that historical (as opposed to mythic) personages and events be thought of as having existed or occurred quite apart from our evidence or lack of evidence for them.<sup>32</sup>

Thus the formal argument from truth-value links can be extended, refined, and filled out in detail so as to offer good reason for doubting the credibility of an antirealist approach to issues of historical truth. Moreover one could put the case that anti-realism in this current, no matter how sophisticated logico-semantic guise is a reversion to something very like the stage of proto-historical enquiry that Williams locates in the period just before Thucydides developed the methods and techniques of

critical historiography. Thus it gives up the idea of objective (verification-transcendent) truth, along with that of a linear, i.e., non-cyclical temporality with truth-value links between past, present, and future. Williams makes this point rather nicely when he remarks that ‘Herodotus had also shrewdly discussed the material remains of past times, such as the many wonderful things he saw in Egypt’.

However, he continues, ‘there is a special, and very typical, twist in Thucydides’, when ‘assessing the remains of ancient Mycenae that were to be seen in his time, he compares them with the remains that he supposes might be left to future generations by contemporary Athens and Sparta’.<sup>33</sup> What is required for this is the grasp of an objective temporal sequence that stretches back and forward beyond the limits of personal experience yet which takes such experience as its basis for asserting the reality of past events – quite apart from our knowledge concerning them – and the awareness of a future when historians’ claims with regard to some presently existing state of affairs will likewise be rendered true or false (whatever their evidential warrant) by the facts of our current situation. In short, ‘the explanatory unity of the world binds not just the past and the present, but the present and the future as well; and concrete expression is given to the idea that our today will be someone else’s distant past’.<sup>34</sup>

Where anti-realism signally fails to convince is in offering no plausible explanation of how historiography could ever have advanced beyond its stage of confinement to mythic, uncritical, or taken-for-granted modes of communal belief. Indeed, by denying (or finessing) the argument from truth-value links and preferring, as Dummett says, to take ‘our evidence for and memory of the past as constitutive of it’ anti-realism reverts – in theory at least – to something very like that stage.<sup>35</sup>

Dummett anticipates this objection and goes various ways around in attempting to head off its strong intuitive force. The anti-realist may begin by remarking that it is warranted assertibility, not truth, that is in question here and then go on to argue that realist errs by ignoring the temporally indexed character of what counts as warranted assertibility from one such temporal context to another. That is to say, she (the realist) deploys the apparatus of tense-logic in a merely abstract or formally regimented way without taking sufficient account of the various possible changes, e.g., expansions or contractions in the range of available evidence that may occur with the passage of time.

Thus she assumes that the relevant truth-conditions can be specified without substantive or more-than-notional restriction to the particular time of utterance and the kinds of epistemic warrant obtaining at just that time. In which case the anti-realist will demand that their opponent accord a more central role to the agency of time and not assume a static (fundamentally atemporal) conception wherein truth is thought of as evidence-transcendent or epistemically unconstrained. However, as we shall see, this response to the realist’s challenge allows Dummett no exit from the paradox of retroactive truth-conferral and indeed involves him in some fairly extravagant conjectures of just that sort.<sup>36</sup> Among them is the idea that in certain (albeit unusual) cases a change in our knowledge of (or evidence for) past events may be thought of as somehow *bringing it about* that those events either should or should not have occurred, or transpired in some particular way.

At this point the realist will most likely reply that if anti-realism lends credence to such patently absurd ideas then they had best be seen as a *reductio ad absurdum* of the antirealist case, and hence more usefully employed in showing just what's wrong with Dummett's logico-semantic update on verificationist themes. Thus it is no great distance – 'logically' speaking – from the thesis that truth-values cannot possibly transcend the limits of verification or assertoric warrant to the notion that the 'truth' of past events must indeed be subject to (even in some sense determined by) whatever we possess in the way of corroborative evidence for them. Here again Dummett is aware of the obvious realist rejoinder, i.e., that ascriptions of truth differ from ascriptions of empirical warrant, justified belief, present-best knowledge, and so forth, since truth-values are strictly indefeasible by any evidence that might turn up (or drop out) in the course of further enquiry. Still he feels compelled to adopt an anti-realist position – and to accept at least some of those awkward consequences – on logical as well as metaphysical grounds. That is to say, Dummett simply cannot make sense of the basic realist claim that we are able to conceive the existence of truths that transcend our best capacities of proof, ascertainment, or verification.

Moreover, he takes the instance of mathematics as a prime exhibit for anti-realism despite what would seem the inherent implausibility of any argument that confines mathematical truth to the compass of our best available proof-procedures or utmost computational powers. Here if anywhere there seems good reason to suppose (1) that the range of objective truths outruns our optimal capacity for proving, conceiving, or expressing them, and (2) that those truths decide the validity of our various well-formed (truth-apt) statements or theorems, rather than the other way around.<sup>37</sup> At least his approach has the virtue of posing these issues in their sharpest possible form and obliging his opponents to formulate their case with maximum care and precision so as to avoid falling into some well-laid anti-realist traps. Indeed it is the claim most often advanced on behalf of Dummett's pre-eminent status in current philosophical debate that he has managed to come up with a radical redefinition of the terms on which this longstanding dispute (i.e., between realism and anti-realism) must henceforth be conducted.

Of course one might interpret that claim as bearing only on certain rather technical or specialised issues in philosophy of language and logic, and hence as stopping well short of the extreme proposal that reality *just is* whatever we make of it according to the scope and limits of human perceptual, cognitive, or epistemic grasp. However this interpretation runs up against problems when it comes to Dummett's (so far as one can tell) quite seriously meant talk about 'gaps in reality' and also those essays – like 'Bringing About the Past' – where he seems more than half-way convinced that changes in our present state of knowledge concerning past events can somehow influence (or even retroactively determine) the occurrence, non-occurrence, character, or outcome of those 'same' anterior events.<sup>38</sup>

It is here that antirealism in the Dummettian (analytic or logico-linguistic) mode comes closest to that strain of idealist thinking exemplified by the Oxford philosopher J. M. McTaggart whose influence Dummett readily admits in his own approach to these questions.<sup>39</sup> There is also a parallel with certain rather *outré* quantum-theoretical conjectures such as that of the astrophysicist John Wheeler who suggests – on the basis of laboratory-scale experiments to prove the existence of superluminal (faster-than-light) communication between pairs of remotely 'entangled' particles –

that the same might apply to the retrocausal effect of momentarily switching a radio-telescope parameter and thus 'bringing about' some celestial event like a supernova at some billions of light-years' distance.<sup>40</sup>

My point is that Dummett's 'technical' arguments in philosophy of language and logic have large (and quite drastically revisionist) implications for our thinking about issues in epistemology, ontology, and metaphysics. As regards their proper order of priority he maintains that this is the right way around and that logico-semantic considerations are our best guide to the settlement of issues in other, more contentious or less clearly demarcated regions of philosophical dispute.<sup>41</sup> All the same – as I have said – one may reasonably doubt whether Dummett's address to these matters is motivated solely (or chiefly) by his interest in sorting out the scope and limits of truth-talk in various contexts of enquiry or regions of discourse. Indeed one might go so far as to suggest that very often the metaphysical tail is wagging the logico-semantic dog, or that Dummett's more technical discussions of the realism/anti-realism issue are motivated in large part by his concern with questions such as that of the possible efficacy of prayer in deciding the as-yet unknown outcome of past events. (His example here involves the predicament of a father who prays that his son should not have been killed in a battle that has already taken place.)<sup>42</sup>

I am not making the claim that antirealism in its current, Dummettian or logico-linguistic mode amounts to just a kind of technical camouflage for theological or metaphysical interests that dare not quite speak their name. After all it is a doctrine (or researchprogramme) that has not only captured the high ground of recent philosophical debate but succeeded in convincing a good many thinkers of an otherwise contrary (realist) persuasion that its arguments are sufficiently strong to require a very detailed and sophisticated effort of rebuttal. Thus there is something inherently plausible about the basic anti-realist point, i.e., that if truth is conceived as objective (= recognition-transcendent) then *by very definition* it lies beyond our furthest powers of perceptual, cognitive, epistemic, or conceptual grasp. The standard test-case – at least for anti-realists – is that of mathematics where the argument goes that the realist is inevitably backing a loser since there seems no way that we could possibly have contact with (or epistemic access to) a realm of abstract entities such as numbers, sets, or classes which *ex hypothesi* transcend or exceed our capacity to comprehend them.<sup>43</sup> Hence the seeming paradox much exploited by sceptics and anti-realists: that we can *either* have mathematical truth realistically (objectively) conceived *or* mathematical knowledge within the limits of proof or computability but surely not both unless at the cost of embracing a Platonist conception whereby knowledge somehow links up with truth via some kind of sublimated (quasi-perceptual) means of access.

### III

As I say, this line of argument is apt to strike one as possessing a knock-down philosophical force if taken on its own terms, i.e., on the assumption that these are the only alternatives and hence that realist (objectivist) truth in mathematics, logic, or the formal sciences cannot be conceived except as transcending – and *ipso facto* eluding – any knowledge we could possibly have of it. Yet it is likely to seem altogether less persuasive if one weighs it against the opposed considerations brought up by mathematical realists. Thus there is an irony about the fact that anti-realists have often

claimed support from Gödel's incompleteness proof, that is, his demonstration that any system sufficiently complex to generate the axioms of elementary arithmetic will necessarily contain certain theorems which cannot themselves be proven within that system.<sup>44</sup> However – as exegetes like Penrose are quick to point out – this result, so far from counting against the existence of verification-transcendent truths, in fact lends weight to just the opposite (realist) conclusion, i.e., that we are capable of knowing that such truths exist despite their transcending the limits of formalised proof or computability.<sup>45</sup>

Gödel himself put the case against a good many current anti-realist arguments when he wrote that 'mathematical intuition need not be conceived as a faculty giving an *immediate* knowledge of the objects concerned . . . Rather, they, too, may represent an aspect of objective reality, but, as opposed to sensations, their presence in us may be due to another kind of relationship between ourselves and reality'.<sup>46</sup> That is to say, the realist about mathematics need not be saddled with anything like the 'sublimated Platonist' conception of knowledge – the idea of our somehow having quasi-perceptual epistemic 'contact' with a realm of purely abstract entities – that is often foisted upon her by sceptics of various persuasion.<sup>47</sup> Moreover this alternative Gödelian view (taken up and developed by recent advocates of a rationalist-realist approach) manages to avoid some of the drastically counter-intuitive conclusions that result from Dummettian anti-realism when applied to particular cases.<sup>48</sup> Among them, for instance, is the absurdity of thinking that Fermat's Last Theorem – or the statement 'Fermat's Last Theorem is true' – was itself somehow neither true nor false until just that moment, after three centuries of failed efforts, when David Wiles traversed the last stage of his immensely complex and elaborate proof.<sup>49</sup>

No doubt it may be said that the proof was subject to challenge when first announced, then revised and strengthened in response to that challenge, and indeed might yet (quite conceivably) turn out to contain some further, as yet unnoticed weakness or logical flaw which casts doubt on its validity. However this objection is no more damaging to the mathematical realist's case than the similar argument brought against defenders of realism in the physical sciences. There it takes the form (as we have seen) of a sceptical meta-induction, or generalised 'argument from error', to the effect that most scientific theories to date have either been proved false or shown to hold good only within some restricted range of application, along with the various object-terms whose ontological standing was dependent on their role within those (nowadays discredited or superseded) theories. So the idea that we are now any better off in this respect – that our currently accredited theories are an exception to the general rule – must involve a high degree of epistemological hubris and also a failure, on the part of realist philosophers of science, to learn the most striking lesson offered by their historically-minded colleagues.<sup>50</sup>

Yet it is precisely the realist's point – to repeat – that this argument itself *cannot but* have recourse to the conception of truth as transcending (and potentially falsifying) any particular thesis advanced at any stage in the history of scientific thinking to date. Thus it takes for granted the basic convergent-realist claim that theories and their associated object-terms may be subject to revision, qualification, or outright rejection on the strength of later (more adequate) evidential or theoretical-explanatory grounds.<sup>51</sup> After all it is no part of the realist's case to argue for our present state of scientific knowledge as secure against possible challenge or as having at last come out

beyond any prospect of falsification. Indeed, as Nicholas Rescher points out, it is precisely this acceptance of the ‘non-finality of science as we have it’ – of the fact that even our most secure or well-established theories might always, in principle, be subject to challenge – that constitutes the realist’s chief argument for the existence of objective, recognition-transcendent, or (at present) unverifiable truths.<sup>52</sup> Thus the standard sceptical meta-induction from past errors to the error-prone nature of all, including our current-best and future most advanced states of scientific knowledge is an argument that the realist can turn back against the sceptic to powerful effect.

The case is rather different with mathematics since here any true proposition or valid proof must be taken to hold necessarily – or, in modal-logical parlance, across all ‘possible worlds’ – and therefore cannot be subject to disconfirmation as the result of some anomalous empirical result or some piece of conflicting evidence turned up in the subsequent course of enquiry. Jerrold Katz makes this point in a passage that also brings some useful clarification to the issue about Platonism and ‘epistemic contact’, so I shall take leave to quote it at length.

The entire idea that our knowledge of abstract objects might be based on perceptual contact is misguided, since, even if we had contact with abstract objects, the information we could obtain from such contact wouldn't help us in trying to justify our beliefs about them. The epistemological function of perceptual contact is to provide information about which possibilities are actualities. Perceptual contact thus has a point in the case of empirical propositions. Because natural objects can be otherwise than they actually are (*non obstante* their essential properties), contact is necessary in order to discover how they actually are . . . . Not so with abstract objects. They could not be otherwise than they are . . . . Hence there is no question of which mathematical possibilities are actual possibilities. In virtue of being a perfect number, six must be a perfect number; in virtue of being the only even prime, two must be the only even prime. Since the epistemic role of contact is to provide us with the information needed to select among the different ways something might be, and since perceptual contact cannot provide information about how something must be, contact has no point in relation to abstract objects. It cannot ground beliefs about them.<sup>53</sup>

No doubt the anti-realist will protest that this simply begs the question with regard to the existence (or objective reality) of those various abstract items – numbers, sets, classes, etc., along with the range of true or false propositions concerning them – which he (the anti-realist) takes to ‘exist’ only in so far as they play some role in our present-best reasonings or proof-procedures. At which stage, perhaps, we should draw the conclusion that this a dispute beyond hope of settlement on any terms acceptable to both parties since it is one that involves such a sharp divergence of metaphysical views. Still the realist need not be stuck for an answer even if it is one that the antirealist will routinely dismiss as buying into a naïve (‘Platonist’) metaphysics and a notion of our somehow having epistemic ‘contact’ with suchlike abstract entities, no matter how explicitly Katz, Gödel and others may have argued against that idea. Thus she can always point out that antirealism leads to some downright bizarre claims, such as (to repeat) the idea that Fermat’s Last Theorem possessed no objective truth-value until a proof was forthcoming. Or again, according to the anti-realist, it was neither true nor false that 311 successive iterations of the digit ‘1’ constituted a prime number

right up until the time when that fact emerged through the development of a computer programme with sufficiently powerful means of factorial analysis.

If these claims strike us as wholly implausible – as representing something like a *reductio ad absurdum* of the anti-realist case – then the same must apply to instances, like that of Goldbach's Conjecture, which involve well-formed and (on the face of it) truth-apt theorems but for which we lack computational means or any adequate proof-procedure that would decide their truth-value either way. For there is no reason – verificationist prejudice apart – to accord such instances special-case treatment and suppose that *just because* they remain unproven (and perhaps forever unprovable) *therefore* we are strictly enjoined to regard them as lacking such a value. Rather we should think – by analogy with those other kinds of case – that the issue concerning their truth and falsehood as a matter of objective (recognition-transcendent) mathematical fact is one that remains entirely unaffected by our present (or even our future-best) capacity to find it out. What Dummettian anti-realism amounts to, on this view, is an illicit extension of certain sceptical arguments as first applied to the methods and procedures of empirical enquiry – in particular Hume's problem about inductive reasoning – so as to encompass mathematics, logic, and the formal (axiomatic-deductive) sciences.

Thus, for Dummett, it is crucially a matter of how we can justify talk of truth where such talk involves some delusive (objectivist) appeal to standards or criteria beyond those which we are enabled to grasp through our capacity to *recognise* the relevant truthconditions and to *manifest* that knowledge in our various practices of formal reasoning. That is to say, just as Hume denied the validity of induction since we could never have demonstrative (logical) grounds for our belief in the existence of causal regularities in nature – such as were presupposed by any attempt to vindicate the claims of inductive warrant – so Dummett denies that we could ever have grounds for supposing mathematical or other kinds of truth to be verification-transcendent.

This comparison may appear less strained if one reflects on the striking resemblance between Hume's sceptical argument (i.e., that causal explanations always and inevitably go beyond the straightforward evidence of the senses) and Dummett's antirealist proposal (i.e., that we venture onto perilous terrain if we suppose that truth-values can possibly transcend the limits of formal proof or empirical verification). What they both refuse to entertain, albeit on very different philosophical grounds, is the notion that we might have rational warrant for supposing certain statements to be true or false as a matter of the way things stand with respect to some given (whether abstract, physical, or real-world contingent) state of affairs, quite apart from any question concerning our sources of evidence or the scope and limits of our epistemic powers. Such is at any rate the basic realist position as defined by contrast with Dummett's type of logico-linguistic – though also, as I have said, metaphysically motivated – antirealist argument. Indeed it is among the more curious features of this whole debate that Dummett's way of framing the issue has so successfully managed to impose its preferential agenda and thereby steered discussion away from other, as one might think more central and substantive topics of concern.

Michael Devitt registers this sense of skewed priorities when he asks what rational justification there could possibly be for construing the issue about scientific realism in truththeoretic terms and thence – through a further twist of anti-realist logic – as

crucially involving our powers of linguistic or logico-semantic grasp. 'Realism', he writes,

is an overarching empirical (scientific) theory or principle. It is initially plausible. It is supported by arguments that make no appeal to theories of language or understanding . . . . What firmer place could there be to stand than Realism, as we theorise in such undeveloped areas as those of language and understanding? In contrast, the poor state of theories in those areas, whether verificationist or not, makes them a bad place from which to start theorising, particularly in determining overarching principles about the nature of reality. To think otherwise is to put the cart before the horse.<sup>54</sup>

From this point of view the realist should reject Dummett's agenda, that is to say, his claim that the issue can best be treated as one concerning the existence (or non-existence) of recognition-transcendent truths, or of bivalent truth-values pertaining to statements of the 'disputed class'. To be sure, it is fundamental to the realist's case that Dummett's argument should *not* go through and that we *can* make sense of the contrary thesis, i.e., that our various well-formed and truth-apt (even if unverified or unverifiable) statements have their truth-value fixed – objectively so – by whether or not they correspond to the way things stand in reality. However she (the realist) will wish to go further and explain how we can none the less claim to have acquired knowledge of some such truths through various well-tried investigative methods and procedures. It is at this point – where metaphysical concerns yield ground to epistemological interests – that the argument is joined by other parties, among them advocates of the case for convergent realism (or inference to the best explanation) as the only means by which to make sense of advances in scientific knowledge to date.<sup>55</sup> Hence Devitt's thought that there is something strictly preposterous – a plain case of 'putting the cart before the horse' – about the notion that a theory (such as scientific realism) which enjoys such a vast range of corroborative evidence should be subject to doubt on the evidence of a relatively 'undeveloped' theory (such as Dummett's logico-linguistic approach) which exerts nothing like so strong a claim on our rational allegiance.

Of course any argument along these lines will fail to impress the convinced anti-realist for whom it is merely begging the question – i.e., the central issue as posed by Dummett – to take the (presumed) self-evidence of scientific progress as trumping the (presumed) highly fallible or dubious case from philosophy of language. No more will it persuade the van Fraassen-type constructive empiricist that his scruples are surely misplaced since all the evidence from scientific history to date points toward a different conclusion. That is to say, it lends weight to the convergent-realist claim that our received physical theories – e.g., with respect to atoms or subatomic particles – have typically advanced from a speculative stage, through a subsequent phase when such items acquired a crucial explanatory role yet when most physicists adopted an attitude of cautious (instrumentalist) reserve as concerned their objective reality, and thence to the point where those doubts became otiose with the advent of more refined observational or measurement techniques.

As I have said, van Fraassen would reject this account by arguing that such techniques – *just because* they are so refined or technologically advanced – can provide nothing like the probative warrant of direct 'naked eye' observation.<sup>56</sup> Still one may think it



decidedly odd (another case of putting the cart before the horse) when van Fraassen draws his line for admission to the class of 'real' objects at the limit-point of plain, unaided human perceptual capacity. For this is to ignore a chief lesson from the history of science to date, namely that progress has most often come out through a break with the commonsense habit of relying on 'straightforward' perceptual self-evidence and a willingness to advance alternative theories and hypotheses.

These latter have ranged all the way from the most basic causal-explanatory conjectures – indispensable to science whatever Hume's (and van Fraassen's) sceptical thoughts on the matter – to the positing of certain as-yet unobservable objects (whether subatomic particles or planets) whose existence is deduced from their necessary role in resolving otherwise intractable problems and anomalies. Here again the typical pattern of development is from well-formed, truth-apt, but as-yet unverifiable (or unfalsifiable) hypotheses to theories so framed as to be capable of proof with some further – scientifically conceivable – advance in our means of testing them against the empirical evidence. However this is definitely *not* to maintain (like van Fraassen) that there is no going beyond the empirical evidence at any stage of scientific enquiry. For such a doctrine would preclude the very possibility of achieving any further advances of the kind that brought about the displacement of Ptolemaic by Galilean astronomy, or Newtonian by Einsteinian space-time physics, or pre-quantum by post-quantum conceptions of subatomic structure. That is, it would result in the arrest of scientific progress at whatever stage happened to mark this unfortunate relapse into naïve ideas of empirical self-evidence or the anthropomorphic (pre-scientific) notion that the limits of direct human perceptual acquaintance are the limits of attainable knowledge. Besides, as I have said, there is the further telling objection to van Fraassen's line of approach – one borne out by a vast range of neurophysiological and cognitive-psychological research – that what he takes as 'direct' sensory uptake is in fact no such thing but the product of various, immensely complex operations of perceptual processing.<sup>57</sup>

Thus it is the merest of entrenched 'common-sense' prejudices that would attach more weight to the deliverance of (so-called) 'naked eye' perception than to the kinds of technologically enhanced observation made possible by sophisticated instruments whose workings (and whose possible defects, limits, or interference-effects) we are well placed to understand since, after all, they have been designed and constructed on established scientific principles. At least one may claim with good warrant that we now know more – with benefit of just those technologies – than was known when we had to rely on 'direct' sensory acquaintance or on comparative crude prosthetic devices like optical microscopes or telescopes.

In which case perhaps the undeniable subtlety, wit, and resourcefulness that van Fraassen deploys in support of his thesis should best be seen as something very like the impressive yet increasingly wire-drawn argumentation deployed by rearguard defenders of Ptolemaic astronomy against the new Copernican-Galilean cosmology. What has changed in the interim is that these problems have shifted from the first-order scientific terrain (where rival parties were divided with respect to the two 'world-systems' proposed by Ptolemy and Copernicus) to a meta-level dispute concerning the status of scientific knowledge in general and the existence – or otherwise – of truth-values that exceed the limits of empirical verifiability.

This is the main point of convergence between van Fraassen's constructive-empiricist outlook and Dummett's anti-realist approach, despite their very different philosophical agendas, the one focused chiefly on epistemological issues and the other on issues in philosophy of language, logic, and metaphysics. Where they agree is in rejecting any talk of truth that exceeds the limits of empirical warrant (van Fraassen) or decidability according to our best available proof-procedures, sources of evidence, or means of verification (Dummett). Yet in both cases the argument runs up against a range of (to my mind) decisive objections. Among them is the fact that truth must play an indispensable role in any adequate characterisation of knowledge, and that one distinguishing mark of truth – except on the pragmatist conception of it as whatever is currently and contingently 'good in the way of belief' – is precisely its *not* being subject to the kinds of epistemic limitation (or dependence on our current-best state of knowledge) entailed by such doctrines.

Thus one is tempted to say that the *whole point* about truth, objectively conceived, is that it cannot be subject to the varying fortunes – including the chance of revision or downright disconfirmation – which always go along with epistemic conceptions like those of certainty, empirical warrant, 'truth' according to present best judgement, or even (at the limit) idealised rational acceptability. To suppose otherwise is simply to change the subject, or to find ways of redefining the truth-predicate so as to bring it safely back within the compass of humanly attainable knowledge.

#### IV

This strategy has exercised its strongest appeal among those most struck by the sceptical challenge in its latest (anti-realist) form, i.e., the idea that if truth is conceived in objectivist (recognition-transcendent) terms then *ex hypothesi* it cannot be known. And indeed there is no way around that sceptical argument if one accepts (1) that truth-values are epistemically constrained, (2) that warranted assertibility is the furthest we can get in such matters, and (3) that any thought of truth as transcending the limits of assertoric warrant is a thought that inevitably self-destructs on the manifest absurdity of claiming to know – to assert as a matter of truth – what exceeds our best means of proof or verification.

It is not hard to see why anti-realism in this highly sophisticated logico-semantic guise has acquired such prominence in recent debate and spawned such a vast literature devoted to defending, strengthening, further refining, or (in some cases) trimming its claims so as to avoid any too direct conflict with realism as regards this or that specific area of discourse.<sup>58</sup> After all, it trades on the *prima facie* plausible idea that there *must* be something wrong – conceptually confused – about assertions of kind: 'I know statement *x* to be true [or false] even though I possess no means or method whereby to verify [or falsify] *x* and, what's more, no grasp of the conditions (i.e., those for warranted assertibility) under which I might come to recognise its truth-value and manifest my knowledge of them'. However the case looks far less plausible if one rephrases the realist claim to read: 'I know that certain well-formed and truth-apt statements are *either* true *or* false – objectively so – despite my present and even (perhaps) despite anyone's future inability to verify or falsify those statements'. For it then becomes clear that the first way of putting the realist claim – embroiling it in patent absurdity or self-contradiction – simply begs the question since

it takes for granted the anti-realist premise that truth is epistemically constrained and hence that the realist *cannot but* be making a strictly nonsensical statement.

However, as the second version makes clear, this is not at all what the realist has in mind since of course she rejects that premise outright (holding truth-values to be recognition- or verification-transcendent), and is therefore committed to nothing like the confusion so misleadingly foisted upon her by the anti-realist. At which point she can best turn the tables – though without any philosophic sleight-of-hand – and ask what further, more convincing justification the anti-realist can offer in support of a position which now looks to bear a much heavier burden of proof. Thus he will need to make good such claims as that Fermat's Last Theorem was neither true nor false until its proof was at last achieved, or that the truth-value of certain statements concerning remote astrophysical objects and events is determined by the scope and limits of human observation rather than decided – as the realist would have it – by astrophysical reality.

Even those of a marked anti-realist persuasion who have taken Dummett's lessons very much to heart quite often have trouble in going along with the consequences of his argument when spelled out in such explicit or case-specific terms. Thus some – Crispin Wright among them – have advanced various middle-way proposals which acknowledge the force of that argument with regard to any kind of full-strength 'metaphysical' realism while conserving a place for certain of our deep-laid realist intuitions as applied (say) to mathematics or the physical sciences.<sup>59</sup> However, as I have argued at length elsewhere, such efforts always end up *either* by endorsing the realist (objectivist) case in a form hedged about by various merely notional caveats and qualifying clauses *or* by falling back to a fairly standard version of the anti-realist line with just a few accommodating nods toward the kinds of realist objection noted above. The reason is plain enough: that there is simply no negotiating a midway or viable compromise solution with respect to those well-developed and conceptually precise areas of discourse – such as mathematics, logic, and the formal sciences – where any least concession to the view of truth as epistemically constrained or recognition-dependent is enough to constitute a repudiation of realism, albeit (very often) one that dare not quite speak its name.

So, for instance, when Wright puts forward his notions of 'superassertibility' and 'cognitive command' he is careful to specify the relevant criteria for statements of each type in terms that would appear to meet the realist's objection by building in additional constraints beyond those of (mere) assertoric warrant. 'Superassertibility' he defines as an attribute pertaining to any statement just on condition that 'some warrant for it would survive arbitrarily close scrutiny of its pedigree and arbitrarily extensive increments to or other forms of improvement of our information'.<sup>60</sup> For a discourse to exhibit 'cognitive command' is for statements of that discourse to meet the requirement that 'any difference of opinion will be such that there are considerations quite independent of the conflict which, if known about, would mandate withdrawal of one (or both) of the contending views'.<sup>61</sup> However these are still *epistemic* constraints, as can plainly be seen from such locutions as 'scrutiny of its pedigree', 'improvement of our information', and – lest 'quite independent of the conflict' be taken to lean too far in a realist direction – the crucial rider 'if known about'.

Thus for all Wright's desire to accommodate the realist on the main points at issue with respect to certain such areas of discourse his approach still works out as an endorsement (albeit a somewhat queasy endorsement) of the antirealist case. This emerges with particular clarity in his treatment of mathematics where Wright evinces a marked reluctance to go all the way with Dummett's constructivist, intuitionist, or proof-theoretic (as opposed to truth-based) conception yet conspicuously draws back from asserting any full-fledged realist commitment. Thus: 'in shifting to a broadly intuitionistic conception of, say, number theory, we do not immediately foreclose on the idea that the series of natural numbers constitutes a real object of mathematical investigation, which it is harmless and correct to think of the number theoretician as explaining'.<sup>62</sup> I can see no way of interpreting this oddly contorted sentence unless as a sop (more respectably: a source of reassurance) to the mathematical realist hedged around by various knowing asides – among them the adjective 'harmless' – designed to placate those of Dummettian persuasion who will no doubt bridle at any such concessions to the adversary camp.

There is a similar unresolved tension in recent attempts by other philosophers of mathematics to come up with some middle-ground formulation that would save realist appearances while yielding no hostages to objectivist (and hence, on their own terms, sceptical) fortune. These involve the idea of a 'humanised Platonism' which, unlike its 'sublimated Platonist' counterpart, brings the whole issue intelligibly down to earth in those various mathematical practices, reasonings, and warranted proof-procedures that constitute truth so far as it can possibly be known.<sup>63</sup> On this account truth is 'conceptually structured' – and hence within epistemic reach – yet still somehow capable of offering guidance (or correcting our erroneous judgements) when we are disposed to get things wrong. What prevents us from seeing this is an unfortunate attachment to the kind of sublimated Platonist conception which equates truth with something that stands intrinsically above and beyond our best powers of epistemic grasp. Hence the colourful analogy drawn by Alex Miller in his debunking estimate of what gives rise to the objectivist delusion (along with the equally disabling sceptical backlash) in philosophy of mathematics. 'In our pre-theoretical thinking', he writes,

we have a perfectly healthy desire for a degree of independence between our judgements and the facts which those judgements are capable of tracking. When we do philosophy, this healthy desire becomes sublimated into an *unhealthy philosophical conception* of what this independence has to consist in. So just as Gustav Mahler's perfectly healthy respect for women becomes sublimated into an unhealthy syndrome known as the Virgin Mary complex, our own perfectly healthy desire for a measure of independence between the knower and what is known becomes sublimated into the idea that the properties which the judgements of the knower cognitively access have to be conceptually unstructured.<sup>64</sup>

We can best get over this unhealthy fixation – so the argument goes – if we cease the vain hankering for objective truths that could somehow (impossibly) be accessed quite apart from our means of coming to know them. Rather we should see that mathematical knowledge is in no way compromised or rendered less secure by its dependence on our various reasonings, reckonings, or established proof-procedures. That is to say – and here Miller takes his cue from John McDowell – the whole misbegotten congeries of problems around truth, knowledge, and scepticism begins

with that delusive ('sublimated') Platonist conception of truth which assigns it to a realm of absolute ideal objectivity beyond any epistemic contribution on the knower's part.<sup>65</sup> Where the hard-line realist goes wrong is in supposing that 'we can think of our judgements about the instantiation of a property as capable in principle of tracking or cognitively accessing the facts about its instantiation only if the property in question is conceptually unstructured'. On the humanised Platonist account, conversely, we can 'think of ourselves as tracking or cognitively accessing the facts about the instantiation of conceptually *structured* properties'.<sup>66</sup>

Miller has his own differences with McDowell as regards the precise working-out of this approach. Still he shares McDowell's basic conviction that the only way around the 'problem of knowledge' with regard to mathematics and other truth-apt areas of discourse is one that makes room for the conceptual structuring of everything that falls within their remit and which thus restores truth to the compass of humanly attainable knowledge. However this solution just won't work, as becomes clear from McDowell's often tortuous attempts to explain how one can have a fully adequate measure of objectivity (i.e., an account of how truth might always come apart from best judgement or even from the standard of idealised rational warrant) along with an epistemic approach that restricts truth-values to the range of statements for which we possess some demonstrable means of proof or verification.<sup>67</sup>

Hence McDowell's (in my view) somewhat desperate proposal that we should go back to Kant for a viable alternative to the way these issues have been treated in the wake of logical empiricism, i.e., an approach that makes room for the joint and strictly inseparable contributions of Kantian 'receptivity' and 'spontaneity'.<sup>68</sup> Thus we are to think that these latter are really just *faute de mieux* terms of art which denote on the one hand the mind's responsiveness to objective (nonmind- dependent) inputs or sources of knowledge and on the other its inbuilt 'spontaneous' power to cognise or apprehend such truths.

All the same, McDowell cautions, they should properly be thought of as aspects or components of one and the same knowledge-constitutive capacity. Where the error comes in is with the dualist notion (also much encouraged by Kant) that the business of philosophy is somehow to explain how two such heterogeneous 'faculties' as sensuous intuition and conceptual understanding can be brought together through a faculty of judgement whose ultimate source is the power of productive imagination, itself defined as 'a blind but indispensable function of the soul, without which we should have no knowledge whatsoever, but of which we are scarcely ever conscious'.<sup>69</sup> McDowell sees clearly that the travails of much analytic philosophy from the logical positivists and logical empiricists down have resulted from this bad Kantian inheritance, one that fixes an insuperable gulf between truth (or reality) and our knowledge of it and which then goes various intricate and ultimately self-defeating ways around in solving the problem thus produced. Much better start out from Kant's alternative ideas of 'receptivity' and 'spontaneity' since these make room for a non-dualist conception whereby we can at last 'dismount from the seesaw' since the two terms can be taken as referring to the self-same cognitive or epistemic capacity which brings truth back within the compass of humanly attainable knowledge.

However McDowell's argument breaks down on the fact that he is still very firmly seated on the Kantian seesaw, and one whose oscillations cannot be damped by switching from talk of 'intuitions' and 'concepts' to talk of 'receptivity' and 'spontaneity'. That is, such talk still leaves it a mystery (one much exploited by sceptics and antirealists) how we could ever gain knowledge of truths that none the less obtained quite apart from our evidential sources, i.e., our best methods of formal proof or empirical verification. 'If we restrict ourselves to the standpoint of experience itself', McDowell writes,

what we find in Kant is precisely the picture I have been recommending: a picture in which reality is not located outside a boundary that encloses the conceptual sphere . . . . The fact that experience involves receptivity ensures the required constraint from outside thinking and judging. But since the deliverances of receptivity already draw on capacities that belong to spontaneity, we can coherently suppose that the constraint is rational; that is how the picture avoids the pitfall of the Given.<sup>70</sup>

Yet this can scarcely be supposed to resolve the problem – one that McDowell inherits as much from Kant as from the doctrines of logical positivism or logical empiricism – if one considers the extreme contortions of phrasing (and the wrenchings of logical thought) forced upon him by the effort to reconcile the claims of objective, mind-independent truth and attainable knowledge. Thus it is hard to make sense of his idea that thinking and judgement are somehow 'constrained' by that which lies 'outside' their spontaneous grasp – through a power of receptivity that is subject to constant checks and corrections from the external world – while that constraining influence is nevertheless thought of as 'draw[ing] on capacities that belong to spontaneity'. Confusion is worse confounded – or so it seems to me – when McDowell talks about 'reality' as that which is 'not located outside a boundary that encloses the conceptual sphere'. For in that case reality *just is* whatever falls within the scope and limits of our perceptual, cognitive, or epistemic grasp and cannot be conceived as potentially transcending our knowledge of it.

## V

What we are getting here, in effect, is a warmed-over ('analytic') version of the history of German idealism after Kant. Such was the debate between, on the one hand, 'subjective idealists' like Fichte who purported to follow Kant's doctrine to its ultimate conclusion by treating reality as a construct or projection of our egological concepts and categories and, on the other, 'objective idealists' like Schelling who sought to maintain some 'external' (mind-independent) check on those same concepts and categories.<sup>71</sup> What we are also getting is a vague adumbration of some quasi-Hegelian synthesis that would emerge on the far side of all those vexing Kantian antinomies and occupy a standpoint above and beyond their inherently limiting or partial perspectives. However this standpoint turns out to be no such thing but to take us straight back onto the ground of subjective idealism, albeit hedged about by various quasi-objectivist caveats and scruples. Thus, according to McDowell,

[i]t can be difficult to accept that the Myth of the Given is a myth . . . . It can seem that we are retaining a role for spontaneity but refusing to acknowledge any role for receptivity, and that is intolerable. If our activity in empirical

thought and judgement is to be recognisable as bearing on reality at all, there must be external constraint. There must be a role for receptivity as well as spontaneity, for sensibility as well as understanding. Realising this, we come under pressure to recoil back into appealing to the Given, only to see over again that it cannot help. There is a danger of falling into an interminable oscillation.<sup>72</sup>

Still it is far from clear that McDowell has managed to dismount from the seesaw whose oscillations Kant set going through his heroic though ultimately failed attempt to reconcile the twin doctrines of 'empirical realism' and 'transcendental idealism'. Indeed one could write the history of much post-1950 (that is to say, postlogical-empiricist) work in the broadly analytic tradition as a series of projects aimed toward mending the Kantian rift between phenomenal intuitions and concepts of understanding but always – inevitably – running up against the same root dilemma.<sup>73</sup> What has united these movements despite and across some otherwise large differences of view is their shared premise that objectivist (alethic) realism must surely give rise to scepticism by placing truth by very definition beyond our utmost cognitive grasp.

Whence the whole range of alternative proposals – from Dummett's anti-realist agenda to response-dispositional theories and Wright's sundry variations on the theme – that seek to bring truth back within the sphere of human cognitive or intellectual grasp. Yet their upshot is chiefly to exacerbate the problem (and induce yet further swings of the Kantian seesaw) by adopting an epistemic approach which, no matter how nuanced or conceptually refined, fails to uphold the crucial distinction between truth or veridical knowledge on the one hand and, on the other, such fallback notions as 'cognitive command', 'superassertibility', 'best judgement', or 'idealised rational warrant'.

It seems to me that this problem must remain strictly insoluble so long as philosophers persist in confusing metaphysical with epistemological issues, i.e., questions concerning the structure and content of truth with questions concerning our various kinds and degrees of epistemic justification. No doubt this will again be thought to beg the question against anti-realism since it is just Dummett's point that the two sorts of issue are inextricably bound up together. As we have seen, what leads him to adopt that approach is a range of logico-semantic considerations with their chief source in Frege and their upshot in a metaphysical doctrine with far-reaching epistemological consequences.

Thus, according to Dummett, by far the best hope of achieving greater clarity about this issue is to come at it *via* debates in philosophy of language and logic where we are on much firmer conceptual ground than when forwarding large (and inherently contentious) claims about the progress of the physical sciences to date or realism as a matter of inference to the best, most rational explanation. However we should here recall Devitt's argument to contrary effect, i.e., that anti-realism puts the epistemologico-linguistic horse before the scientific cart by taking its cue from a relatively 'underdeveloped' area of discourse (philosophical semantics) and attaching a wholly disproportionate weight to the kinds of problem that result.<sup>74</sup> At any rate there is something distinctly awry about a theory that purports to resolve these issues – even to prevent them from getting off the ground – while in fact blocking their

solution at every turn. What anti-realism chiefly serves to show, as I have argued, is the impossibility of carrying its premises through to a credible conclusion and the fact that we can make rational sense of advances in the physical and formal sciences only on a realist or alethic (truth-based) approach to the various issues involved.

Christopher Norris  
*University of Cardiff*

---

<sup>1</sup> See especially Michael Dummett, *Truth and Other Enigmas* (London: Duckworth, 1978), *The Logical Basis of Metaphysics* (Duckworth, 1991), and *The Seas of Language* (Oxford: Clarendon Press, 1993); also Michael Luntley, *Language, Logic and Experience: the case for anti-realism* (Duckworth, 1988); Neil Tennant, *Anti-Realism and Logic* (Oxford: Clarendon Press, 1987) and *The Taming of the True* (Oxford: Oxford University Press, 1997).

<sup>2</sup> Dummett, *Truth and Other Enigmas* (op. cit.), p. xl.

<sup>3</sup> Dummett, *The Seas of Language* (op. cit.), p. 468.

<sup>4</sup> Dummett, *Elements of Intuitionism*, 2nd edn. (Oxford: Clarendon Press, 2000).

<sup>5</sup> See Dummett, *Truth and Other Enigmas* (op. cit.); also *Frege and Other Philosophers* (Oxford: Clarendon Press, 1991).

<sup>6</sup> Dummett, *Truth and Other Enigmas* (op. cit.), p. 155.

<sup>7</sup> Dummett, *The Seas of Language* (op. cit.), p. 75.

<sup>8</sup> I take this example from Scott Soames, *Understanding Truth* (Oxford: Oxford University Press, 1999).

<sup>9</sup> For some pertinent discussion, see C.J. Misak, *Verificationism: its history and prospects* (London: Routledge, 1995).

<sup>10</sup> Bas van Fraassen, *The Scientific Image* (Oxford: Clarendon Press, 1980); also *Laws and Symmetry* (Clarendon, 1989).

<sup>11</sup> van Fraassen, *The Scientific Image* (op. cit.), p. 8.

<sup>12</sup> *Ibid.*, p. 12.

<sup>13</sup> van Fraassen, 'Empiricism in the Philosophy of Language', in Paul Churchland and Clifford Hooker (eds.), *Images of Science: essays on realism and empiricism, with a reply from Bas C. van Fraassen* (Chicago: University of Chicago Press, 1985; p. 255.

<sup>14</sup> See for instance J.L. Aronson, 'Testing for Convergent Realism', *British Journal for the Philosophy of Science*, Vol. 40 (1989), pp. 255- 60; Aronson, R. Harré and E. Way, *Realism Rescued: how scientific progress is possible* (London: Duckworth, 1994); Richard Boyd, 'The Current Status of Scientific Realism', in Jarrett Leplin (ed.), *Scientific Realism* (Berkeley & Los Angeles: University of California Press, 1984), pp. 41-82; Gilbert Harman, 'Inference to the Best Explanation', *Philosophical Review*, Vol. 74 (1965), pp. 88-95; Peter Lipton, *Inference to the Best Explanation* (London: Routledge, 1993).

<sup>15</sup> M. Gardner, 'Realism and Instrumentalism in Nineteenth- Century Atomism', *Philosophy of Science*, Vol. 46 (1979), pp. 1-34; Ian Hacking, *Representing and Intervening: introductory topics in philosophy of science* (Cambridge: Cambridge University Press, 1983); Mary Jo Nye, *Molecular Reality* (London: MacDonald, 1972); J. Perrin, *Atoms*, trans. D.L. Hammick (New York: van Nostrand, 1923).

<sup>16</sup> See especially Paul Churchland, 'The Ontological Status of Observables: in praise of the superempirical virtues', in Churchland and Hooker (eds.), *Images of Science* (op. cit.); also Christopher Norris, 'Anti-Realism and Constructive Empiricism: is there a (real) difference?' and 'Ontology According to van Fraassen: some problems with constructive empiricism', in *Against Relativism: philosophy of science, deconstruction and critical theory* (Oxford: Blackwell, 1997), pp. 167-95 and 196-217.

<sup>17</sup> See for instance Rodolfo Llinas and Patricia Churchland, *The Mind- Brain Continuum: sensory processes* (Cambridge, MA: M.I.T. Press, 1996); A.D. Milner, *The Visual Brain in Action* (Oxford U.P., 1995); David Rose and Vernon G. Dobson (eds.), *Models of the Visual Cortex* (Chichester: Wiley, 1985); J.Z. Young, *Philosophy and the Brain* (Oxford U.P., 1987).

<sup>18</sup> See Hilary Putnam, 'Language and Reality', in *Mind, Language, and Reality* (Cambridge: Cambridge University Press, 1975), pp. 272- 90; p. 290; also Boyd, 'The Current Status of Scientific Realism' (op. cit.).

<sup>19</sup> See entries under Note 14, above.



<sup>20</sup> For further discussion of these and other such cases, see Stathis Psillos, *Scientific Realism: how science tracks truth* (London: Routledge, 1999).

<sup>21</sup> See for instance Dummett, *On Immigration and Refugees* (London: Routledge, 2001).

<sup>22</sup> Dummett, *The Logical Basis of Metaphysics* (op. cit.), p. 7.

<sup>23</sup> Ibid, p. 7.

<sup>24</sup> See for instance Bertrand Russell, *Our Knowledge of the External World as a Field for Scientific Method in Philosophy* (London: Allen & Unwin, 1914).

<sup>25</sup> For a useful conspectus, see Richard Rorty (ed.), *The Linguistic Turn: recent essays in philosophical method* (Chicago: University of Chicago Press, 1967).

<sup>26</sup> The issue about truth-value links receives some informative and shrewd discussion in Bernhard Weiss, *Michael Dummett* (Chesham: Acumen, 2002).

<sup>27</sup> Bernard Williams, 'What Was Wrong with Minos?', in *Truth and Truthfulness: an essay in genealogy* (Princeton, N.J.: Princeton University Press, 2002), pp. 149-71.

<sup>28</sup> Thucydides, *History of the Peloponnesian War*, trans. Rex Warner (Harmondsworth: Penguin, 1954).

<sup>29</sup> Williams, *Truth and Truthfulness* (op. cit.), p. 163.

<sup>30</sup> See Note 22, above.

<sup>31</sup> Williams, *Truth and Truthfulness* (op. cit.), p. 168.

<sup>32</sup> For a range of views, see Joyce Appleby, Lynn Hunt, and Margaret Jacob, *Telling the Truth About History* (New York: Norton, 1994); Richard Campbell, *Truth and Historicity* (Oxford: Oxford University Press, 1992); Richard Evans, *In Defence of History* (London: Granta Books, 1997); Christopher Norris, *Truth and the Ethics of Criticism* (Manchester: Manchester University Press, 1994); Paul Ricoeur, *History and Truth*, trans. Charles A. Kelbley (Evanston, IL: Northwestern University Press, 1965).

<sup>33</sup> Williams, *Truth and Truthfulness* (op. cit.), p. 167.

<sup>34</sup> Ibid, p. 167.

<sup>35</sup> For further arguments to similar effect, see Michael Devitt, *Realism and Truth*, 2nd edn. (Oxford: Blackwell, 1986); Gerald Vision, *Modern Anti-Realism and Manufactured Truth* (London: Routledge, 1988);

<sup>36</sup> Dummett, 'Can an Effect Precede its Cause?', 'Bringing About the Past', and 'The Reality of the Past', in *Truth and Other Enigmas* (op. cit.), pp. 319-32, 333-50 and 358- 74.

<sup>37</sup> See especially Jerrold J. Katz, *Realistic Rationalism* (Cambridge, MA: M.I.T. Press, 1998).

<sup>38</sup> See Note 36, above.

<sup>39</sup> McTaggart, John, *Philosophical Studies*, ed. S.V. Keeling (London: Longmans, 1934).

<sup>40</sup> J.A. Wheeler, 'Delayed Choice Experiments and the Bohr-Einstein Dialogue'. Paper presented at the joint meeting of the American Philosophical Society and the Royal Society, London, June 5th, 1980. See also F. Selleri, 'Wave- Particle Duality: recent proposals for the detection of empty waves', in W. Schommers (ed.), *Quantum Theory and Pictures of Reality: Foundations, interpretations, and new aspects* (Berlin: Springer Verlag, 1989), pp. 279-32; J.A. Wheeler and W.H. Zurek (eds.), *Quantum Theory and Measurement* (Princeton, N.J.: Princeton University Press, 1983)

<sup>41</sup> See especially Dummett, *The Logical Basis of Metaphysics* (op. cit.).

<sup>42</sup> See Dummett, 'Bringing About the Past' (Note 36, above).

<sup>43</sup> See Paul Benacerraf, 'What Numbers Could Not Be', in Benacerraf and Hilary Putnam (eds.), *The Philosophy of Mathematics: selected essays*, 2nd edn. (Cambridge: Cambridge University Press, 1983), pp. 272- 94; also Michael Detlefsen (ed.), *Proof and Knowledge in Mathematics* (London: Routledge, 1992); W.D. Hart (ed.), *The Philosophy of Mathematics* (Oxford: Oxford University Press, 1996); Hilary Putnam, *Mathematics, Matter and Method* (Cambridge University Press, 1975).

<sup>44</sup> See Kurt Gödel, 'On Formally Undecidable Propositions of *Principia Mathematica* and Related Systems', trans. B. Meltzer (New York: Basic Books, 1962); also Ernest Nagel and James Newtman, *Gödel's Theorem* (London: Routledge & Kegan Paul, 1971) and S.G. Shanker (ed.), *Gödel's Theorem in Focus* (London: Routledge, 1987).

<sup>45</sup> Roger Penrose, *Shadows of the Mind: a search for the missing science of consciousness* (London: Vintage Books, 1994).

<sup>46</sup> Kurt Gödel, 'What is Cantor's Continuum Problem?', in Benacerraf and Putnam (eds.), *The Philosophy of Mathematics* (op. cit.), pp. 470-85; p. 484.

<sup>47</sup> See Benacerraf, 'What Numbers Could Not Be' (op. cit.); also John Divers and Alexander Miller, 'Arithmetical Platonism: reliability and judgement-dependence', *Philosophical Studies*, Vol. 95 (1999), pp. 277-310 and Miller, 'Rule-Following, Response- Dependence, and McDowell's Debate with Anti-Realism', *European Review of Philosophy*, Vol. 3 (1998), pp. 175-97.

<sup>48</sup> See Notes 44 and 45, above; also Katz, *Realistic Rationalism* (op. cit.).

<sup>49</sup> For an informative ‘popular’ account, see Simon Singh, *Fermat’s Last Theorem: the story of a riddle that confounded the world for 358 years* (London: Fourth Estate).

<sup>50</sup> See especially Larry Laudan, ‘A Confutation of Convergent Realism’, *Philosophy of Science*, Vol. 48 (1981), pp. 19-49.

<sup>51</sup> See entries under Note 14, above.

<sup>52</sup> Nicholas Rescher, *Scientific Realism: a critical reappraisal* (Dordrecht: D. Reidel, 1987), p. 61.

<sup>53</sup> Katz, *Realistic Rationalism* (op. cit.), pp. 36-7.

<sup>54</sup> Michael Devitt, *Realism and Truth* (op. cit.), p. 284.

<sup>55</sup> See entries under Note 14, above.

<sup>56</sup> van Fraassen, *The Scientific Image* (op. cit.).

<sup>57</sup> See entries under Note 17, above.

<sup>58</sup> See Note 1, above; also – for a critical review of these developments with extensive bibliography – Christopher Norris, *Truth Matters: realism, antirealism, and response-dependence* (Edinburgh: Edinburgh University Press, 2002).

<sup>59</sup> Crispin Wright, *Truth and Objectivity* (Cambridge, MA: Harvard University Press, 1992).

<sup>60</sup> *Ibid.*, p. 48.

<sup>61</sup> *Ibid.*, p. 103.

<sup>62</sup> *Ibid.*, p. 5.

<sup>63</sup> See Miller, ‘Rule-Following, Response-Dependence, and McDowell’s Debate with Anti-Realism’ (op. cit.).

<sup>64</sup> *Ibid.*, p. 178.

<sup>65</sup> See especially John McDowell, ‘Intentionality and Interiority in Wittgenstein’, in K. Puhl (ed.), *Meaning Scepticism* (Berlin: de Gruyter, 1991), pp. 148-69 and ‘Meaning and Intentionality in Wittgenstein’s Later Philosophy’, *Midwest Studies in Philosophy*, Vol. 17 (1992), pp. 40-52.

<sup>66</sup> Miller, ‘Rule-Following, Response-Dependence, and McDowell’s Debate with Anti-Realism’ (op. cit.), p. 178.

<sup>67</sup> See especially McDowell, ‘Wittgenstein on Following a Rule’, *Synthèse*, Vol. 58 (1984), pp. 325-63.

<sup>68</sup> McDowell, *Mind and World* (Cambridge, MA: Harvard University Press, 1994). For further discussion see Norris, ‘McDowell on Kant: redrawing the bounds of sense’ and ‘The Limits of Naturalism: further thoughts on McDowell’s *Mind and World*’, in *Minding the Gap: epistemology and philosophy of science in the two traditions* (Amherst, MA: University of Massachusetts Press, 2000), pp. 172-96 and 197-230.

<sup>69</sup> Immanuel Kant, *Critique of Pure Reason*, trans. N. Kemp Smith (London: Macmillan, 1964).

<sup>70</sup> McDowell, *Mind and World* (op. cit.), p. 41.

<sup>71</sup> For a well-informed survey of these developments, see Frederick C. Beiser, *The Fate of Reason: German philosophy from Kant to Fichte* (Cambridge, MA: Harvard University Press, 1987).

<sup>72</sup> McDowell, *Mind and World* (op. cit.), pp. 8-9.

<sup>73</sup> See Norris, *Minding the Gap* (op. cit.); also Michael Friedman, *A Parting of the Ways: Carnap, Cassirer, and Heidegger* (La Salle, IL: Open Court, 2000).

<sup>74</sup> Devitt, *Realism and Truth* (op. cit.).