

Quantum Mechanics and Ethical Antirealism:
A Counter-analogy to Boyd

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I. Introduction

Moral antirealism has traditionally cited the existence of enduring ethical disagreements or dilemmas as evidence against an objective moral reality which would otherwise decide them. These conflicts may arise from different moral cultures or from within the same tradition following seemingly from the same set of considerations. Accepting that some such cases are permanently irresolvable suggests an extensional vagueness of the relevant moral concepts (e.g. *right*, *wrong*, *good*, *bad*) and the failed bivalence of any statement containing them that a realist, it seems, is not equipped to explain. That it is indeterminate for example whether the terms *good* or *right* apply to a disputed action seems to preclude saying anything definite about the moral nature which determines, in a specific causal way, the correct use of these terms.

A defender of moral realism must either deny that any enduring cases are truly irresolvable or show how realism *is* equipped to deal with them. The former line of argument, while denying they are irresolvable, might acknowledge that persisting ethical problems are more difficult or intransigent than, say, problems in the sciences. This may, in turn be explained by the relative complexity of moral issues and the comparatively controversial and difficult nature of staging moral experiments [Boyd 213]. The latter kind of defense must show how we can still infer a definite observer-independent reality where our knowledge of it is indeterminate.

In *How to Be a Moral Realist*, Richard Boyd claims in line with this second approach to have provided a “realism [that] not only can tolerate but implies certain failures of bivalence” [Boyd 201]. There Boyd presents a model for an underlying real structure which could explain what he considers analogous cases of indeterminacy in the

special sciences (he uses medical science and evolutionary biology as examples). He subsequently shows how this model from the sciences might be adapted to provide a plausible realist explanation of irresolvable issues in ethics.

Boyd's approach has the added benefit of countering the kind of antirealist argument based on "a presumed epistemic contrast between ethics... and the sciences" [Boyd 183]. On that view, though there may be occasional, deeply puzzling scientific problems, these are never permanent – they seem to be resolved in light of new experiments and theoretical insights. That ethics should differ in this important respect is supposed to suggest its being less objective, less empirically testable, and thus less amenable to a realist interpretation than scientific methods and theories.¹

In this paper I hope to question the feasibility of Boyd's approach and of this type of defense generally by considering another case of scientific conceptual indeterminacy – this time from quantum mechanics. This case will lend itself best to an antirealist interpretation. I hope then to show how an equally if not more plausible analogy can be drawn between this type of indeterminacy and that suggested by enduring ethical cases. If the counter-analogy presented here is successful, it will imply that one should still favor antirealism regarding permanently indeterminate cases in ethics even where a strong analogy to cases in the sciences can be made.

¹ This is to the extent that scientific methods and theories are the accepted standards of those properties lending themselves to realist explanation.

II. Natural Definitions in Boyd

Boyd maintains that the concepts of any sound scientific theory must have natural rather than conventional definitions these being determined by real rather than nominal essences respectively.² Locke has argued and Boyd agrees that because conventional definitions are determined by sensible properties they could not accurately capture the microstructure studied by a general science such as physics which is governed by insensible real essences [Boyd 194]. Statements failing bivalence and extensionally indeterminate concepts, however, present a problem for this claim. These seem to be failures of an otherwise sound scientific system and just as well if not better explained by a constructivist or non-cognitive meta-ethics as by moral realism. It is difficult to see how a definite natural structure could govern that there be these indeterminate cases and up to Boyd to present a model of natural definitions that tolerates them.

For the special sciences studying sufficiently structurally complex phenomena, Boyd proposes a model in which natural kind or property terms have natural definitions with a property-cluster structure and “an associated indeterminacy in extension” [Boyd 196]. On this model, there exist collections of properties in nature which occur in a significant number of cases. The cohesion of these clusters is attributable to underlying *homeostatic* mechanisms or processes by which some of its members promote the presence of others or the whole collection of properties sustains its unity. Such clusters are, furthermore, theoretically interesting; the collection of properties has some

² Nominal essences are distinguished in Locke from real ones as determined by agreement or convention rather than something, he knows not what, outside of human perception, in the world. It is probably worth noting that Boyd is much more optimistic about describing these real essences than Locke.

significant causal or practical effect. Because of this it is often appropriate for us to apply a theoretical term to complete or mostly complete collections.

Partial or incomplete clusters can and do occur, containing only some of the relevant properties and underlying homeostatic mechanisms. For such cases deciding whether our terms apply is meant to be an a posteriori, theoretical question rather than a conceptual one (consistent with their being natural instead of conventional definitions). But in many such cases, Boyd contends, a dichotomous choice between the partial clusters falling under the relevant term or not, cannot rationally be made.³ Such genuinely indeterminate cases will, furthermore, be characterized by a sort of natural resistance to refining them to force a classification. Where attempted alterations render our terms *unnatural* or misleading by requiring “that we treat as important distinctions which are irrelevant to causal explanation or to induction or that we ignore similarities which are important in just these ways” [Boyd 198], we can infer genuine indeterminacy.

Boyd cites the terms “health” or “healthier than” in medical science and “species” in evolutionary biology as examples of concepts which refer to such homeostatic collections of properties with an inbuilt indeterminacy. To see this latter feature, we must consider what would follow from attempting to eliminate their extensional vagueness. For our relative health concept, doing so would require that we compare the healthiness of many practices about which current medical theory says nothing. Refining our concepts for such cases thus seems merely to distract us from more important and relevant practices. In Darwinian evolution, the existence of cases which seem not to fall beneath the extension of two closely related species might tell us something important

³Again, Boyd has in mind scientific a posteriori rationality or reasoning – the kind by which our terms are applied rather than conceptual reasoning.

about the relationship between them. The ability of two species to interbreed and create a hybrid case can signify that they share a not so distant ancestor. The causal relationship between parent and emergent species is itself partially explained by cases which display some but not all the features of each. To eliminate vagueness in the species concept, it seems, would require that we overlook the important causal roles played by borderline cases in the theory of evolution.

Studying the ways in which borderline cases are like and unlike the robust paradigm cases to which our terms unequivocally apply can, Boyd thinks, reveal something about their partial cluster structure. While attempts to refine our concepts (in order to force a dichotomous classification) which render them unnatural or misleading are evidence of their genuine indeterminacy. Thus, Boyd claims “such indeterminacy is a necessary consequence of ‘cutting the world at its (largely theory-independent) joints.’” He contends that the model here sketched “*predicts* that there will be some failures of bivalence for statements which refer to complex homeostatic phenomena” [Boyd 199].

Should Boyd be able to adapt this model to explain indeterminate ethical problems, he will have gone a long way toward defending moral realism. The analogous model, Boyd suggests, would treat moral terms (e.g. *good, right, fair*, etc.) as similarly referring to naturally occurring homeostatic property clusters with an associated indeterminacy in extension. Irresolvable ethical problems would be explained as the borderline cases above were – as instances of partial clustering which permanently avoid classification. The feasibility of that adaptation will, however, depend on how strong an analogy can be drawn between failures of bivalence in science and those in ethics. This

might be accomplished by a more detailed analysis of each kind of case and how well Boyd's model explains each.

Instead of providing such an analysis, however, this essay will assess the strength of Boyd's analogy by presenting an alternative for comparison. I will now discuss another case of scientific indeterminacy, this time in physics (quantum mechanics), which lends itself best to an antirealist explanation. I then consider an analogy between quantum mechanical indeterminacy and the considered ethical cases. In what follows, I hope to show that this alternative analogy is just as if not more plausible than Boyd's.

III. Antirealism and Quantum Mechanics

Boyd's is the type of realist argument that wants to say something definite about the structure of the entities or relations in nature to which our theoretical concepts refer.⁴ Such a realism assumes that natural structures can be "revealed" to us in a straightforward, knowable manner. Hence it maintains that our observations do not significantly or unknowably construct or alter the observed natural state. As such, the causal mechanism by which real structures are conveyed to an observer must be known – since an act of observation (measurement) must occur before we can know them. Only with concrete knowledge of such a mechanism can the effect of the observer be ignored or corrected for and the studied structure recovered.

⁴ In the cases we are considering he needs to in order to refute antirealism.

Results of modern scientific experiments meant to probe the subatomic world seem, however, to exclude the possibility of such a realist explanation. The canonical interpretation of those experiments (the Copenhagen interpretation of quantum mechanics) tells us that the natural structure or “picture” revealed to us relies critically and non-separably on the type of experimental apparatus used and thus on the effect of the observer. Two mutually exclusive pictures, subatomic objects (henceforth I will just use electrons or photons as examples) as waves and as particles, are suggested or can be inferred depending on the measurement being made. There are experiments in which electrons behave like waves – double slit or diffraction experiments in which interference effects are observed – and experiments in which they behave like particles – localized strikes on a scintillating screen, scattering experiments.

Such pictures are mutually exclusive; intuitively, it is very difficult or impossible to think they are somehow the *same* or that there is a third picture which would encompass both. They represent, furthermore, equally valid and accurate representations inferred in a similar fashion from legitimate scientific experiments. Both have followed valid scientific procedures and made scientifically valid assumptions. Thus neither experiment is seen as “privileged” and neither representation favored. Finally it does not appear that the conflicting representations are a result of the approximate or imperfect nature of our experiments or methods of inference. Refining these would not it seems reconcile the two.

There is also a formal constraint, Heisenberg’s uncertainty principle, on both wave and particle natures being revealed simultaneously or by the same experiment. The particle picture of an electron is inferred from experiments in which the electron appears

to have a definite position and the wave picture from experiments in which it seems to have a definite wavelength and thus a definite momentum (given by the de Broglie relation $p = h/\lambda$).⁵ The uncertainty principle tells us that accurately measuring position precludes the accurate measurement of momentum or renders it uncertain and vice versa. In an experiment revealing position, the wave picture of an electron is thus maximally uncertain or inaccurate insofar as we could not pick a single picture (with a fixed wavelength) which corresponded to the electron. In an experiment pinpointing momentum, the position would, conversely, be maximally uncertain and a particle picture of the electron indeterminate.

Many attempts have been made (most notably by Einstein) to think of experiments in which both the wave and particle natures of a photon are simultaneously revealed. Such an experiment would show that quantum mechanics while it includes the uncertainty principle is inconsistent. Consider, for instance, an Einstein thought experiment in which light passes first through a single slit then a double slit screen and finally creates an interference pattern on a third screen. The Copenhagen interpretation tells us that an interference pattern, suggesting a wave representation, arises only because which of the second two slits the photon travels through is uncertain – thus so too is its trajectory or particle nature. Einstein argued that we could control for the transfer of momentum from the photon to the first screen; this could be done, for example, by placing the first screen on sensitive springs in the plane of the screen (normal to the slit). The photon's deflection toward one of the second two slits could then be measured from

⁵ It is important to note that a complete picture of a particle would contain information both about its position and momentum as would a complete picture of a wave. One might say, however, that each is inferred from the accurate measurement of a single essential property.

the screens disturbance in the opposite direction. By observing the photon's trajectory in this way and simultaneously observing the interference pattern on the last screen, we would be observing both its particle and wave properties [Baggott 124-125].

Bohr, a defender of the Copenhagen interpretation and the uncertainty principle's place in quantum mechanics, countered that controlling the transfer of momentum to the screen in the envisioned way *must* imply, consistent with the uncertainty principle, an uncertainty in its position. This uncertainty would, it turns out, destroy the phase coherence of the transmitted light and wash out the interference pattern. Bohr explained as follows: accurately measuring the position of the first screen requires that it be illuminated. In that case, the uncontrollable and unpredictable transfer of momentum from the illuminating light source would obscure the effect of the photon travelling through the slit. If the screen is not illuminated, the transfer of momentum can be controlled in the desired way but we cannot observe the screen's position at all; it is thus maximally uncertain [Baggott 124-125]. One might take things a step further and consider controlling the momentum transfer between the illuminating photons and the screen. But again, consistent with the uncertainty principle, this would imply an uncertainty in the photons' positions which would render the screen's position indeterminate.

Examples such as this show how the Copenhagen interpretation of quantum mechanics (including the uncertainty principle) is in fact consistent: the experimental apparatus too is subject to the uncertainty principle; once this is taken into consideration, a quantum mechanical explanation of any measurement process will in fact confirm that interpretation.

Our inherent inability to find a single robust representation which applies unconditionally to the studied phenomena could have been predicted not simply from the fact that we were using familiar concepts in an unfamiliar setting, but that we used inherently visual models or metaphors at all. The validity of these models in classical physics depended on the fact that the mode of observation (light reflected or emitted off the studied object and focused onto the retina) or apparatus was not importantly interactive with the studied object. Even what is now considered only an approximate theory of light (Maxwell's theory, say) told us that a classical object unobserved (e.g. unilluminated) did not behave appreciably different than while observed. This assumption, of course, breaks down on the subatomic scale. There quantum theory considers light non-negligibly interactive with the studied phenomena.

The type of realism discussed above might have been preserved and we might have continued applying visual models unconditionally to subatomic phenomena if light's (or the apparatus') interaction could be factored out. For this to be possible, however, we must have an exact representation of light or photons – to know *how* they interact. But photons are also dually waves and particles in quantum theory and also subject to the uncertainty principle as its consistent application requires.⁶

Insofar as defending realism requires that one show how a definite natural structure gives rise to scientifically indeterminate cases, one cannot be a realist for such cases in quantum mechanics. There, the revealed natural structure depends critically and non-separably on the observer and type of observation made. It is not that we need to

⁶ *Where* this breakdown occurs does not require either that our theory of light be approximately true. This occurs merely where our comprehensive theory (of quantum mechanics including a description of human vision) becomes importantly and self-referentially inconsistent; in this case, where its interpretation invalidates its mode of expression (the straight forward use of classical visual models with a realist assumption about their correspondence).

think of a better more encompassing structural metaphor or model to describe electrons, but that the normal inductive procedures and assumptions for inferring such models are no longer valid in the studied context. The failure in quantum mechanics to agree upon a single model which corresponds to the real world is predicted by the Copenhagen interpretation. This shows both that we have reached the limit of a particular mode of expression – using classical terms and classical assumptions – and that it is either impossible, highly impractical, or otherwise undesirable to change it.⁷

The typical move in quantum theory has subsequently been to adopt some sort of instrumentalist or positivist stance. Such a position views the formalism as a convenient tool for producing observable correlations but avoids talk altogether of the nature that might cause them.

IV. An Antirealist Analogy

Indeterminate cases in quantum theory and their standard antirealist interpretation seem to provide a clear alternative to those Boyd discusses from the special sciences which are more amenable to scientific realism. In this section I want to investigate the possible comparisons that can be made between quantum mechanical indeterminacy and irresolvable ethical problems.

⁷ As scientists, we can happily continue to use visual metaphors conditionally. I am arguing that doing so is fatal Boyd's type of realist argument.

In the sciences the realist assumed that the mode of observation – typically the experimental apparatus – did not significantly or unknowably interact with or construct the state of the studied phenomena. In the moral case, the realist must make an analogous assumption about the “media” through which the moral phenomena are observed. These will include everything from discursive moral tests (e.g. the categorical imperative, greatest happiness principle) to the largely unconscious set of conceptual procedures by which the relevant information is identified and the appropriate language with which to describe it is selected. Such media may, furthermore, operate in cases of direct or indirect observation (i.e. through a source with its own set of procedures). For the realist, ideally, the results of these modes of observation would be determined by a moral reality. Where the facts are significantly constructed too by these modes, they can be said to introduce some important bias toward their results, and can be said to *interfere* in a sense analogous to a physical instrument’s interfering with the objects it measures.⁸

In *Manufacturing Consent*, Noam Chomsky provides a nice example of a source, the news media, by which we, political or ethical theorists, receive “facts” for theoretical consideration. Though we may not have suspected it, these facts turn out to be already significantly morally interpreted and thus biased towards a particular conclusion. The procedures (explicit or implicit) for deciding which stories to cover and how to cover them, Chomsky argues, embody the economic and socio-political interests of the controlling parties – the interests of big business, the demographic to which they cater, and their sources of information. These influences, ultimately, construct the facts in such

⁸ As in the scientific case, we are aware that our measuring apparatus is subject to scientific explanation, we just fail to consider this relevant until it becomes significantly interferential. The media through which we observe moral facts are unlikely to receive attention or be thought of even as media (as something *between* the observer and the observed) until they become interferential or distorting or introduce a bias.

a way that precludes criticism of corporate owners, advertisers, and the U.S. government. The eventual moral and political conclusions drawn from this source will, subsequently, be biased in the same ways [see Chomsky].

Explicit moral tests (e.g. the categorical imperative) are more obviously based on general ethical premises (e.g. egalitarianism) which, for some cases, we might say bias their conclusions in an important way. Chomsky's example shows us how the interference of moral media can be both unobvious and influential. We were not inclined to think the procedures for covering stories in a supposedly objective news media could construct those stories in a significantly self-serving way.

To identify such a bias Chomsky had to consider carefully the political, economic and even moral agendas of large news media owners. Even with this knowledge, however, it was possible that these agendas had not been allowed to interfere with providing fair and accurate coverage of all the important events; it was thus possible that this coverage was still unbiased. Chomsky also needed an array of statistics and other testimony, professional and personal which seemed collectively to form an alternative, more objective picture (e.g. agreeing despite representing a broader set of interests). Only with such an alternative could he expose the kinds of distortions in the accounts of large U.S. news media that served the interests of their corporate distributors. A rough criterion, then, for a biased account is that it be crucially inaccurate – thus we must have a more objective version with which to compare it – and that this inaccuracy serve the interests of those whose account it is.⁹

⁹ For the purposes of this paper, I will assume that an account needn't be *intentionally* modified to serve one's interests in order for it to count as biased – one's interests might interfere subconsciously.

Often, however, no other obviously more objective version exists; sometimes there is *no* alternative and other times every alternative seems simply to embody a different bias. In many cases of this latter type there will be significant disagreement about the facts (such that all accounts cannot be right) and the disagreeing parties will consider each other's accounts biased but not their own. It is in this type of case, I want to suggest, that our moral conclusions become genuinely indeterminate. It is also such cases in which the media of moral observation seem to significantly and unknowably construct their moral conclusions; there is general agreement that *some* bias is determining or distorting the facts though opposing sides differ on where and how it is doing so.

Here, divergent accounts resemble the divergent quantum mechanical models and the separate media, or set of filters through which those accounts are rendered, are like different experimental apparatuses which in quantum mechanics reveal those pictures. On this analogy, considering one's own account and methods objective will *entail* biases in the disagreeing accounts and the methods by which these are got.¹⁰ This entailment will preclude the simultaneous objectivity of both media and the simultaneous accuracy of both accounts – just as the simultaneous measurement of both wave and particle properties was precluded by the uncertainty principle.

Consider for example, the following hypothetical dispute on the extension of the term “person” in the abortion debate (though this could just as easily extend to animal rights cases, issues on the treatment of minors, etc.). From the conclusion that the fetus is

¹⁰ Even where conceptual rules are concerned (there seem not to be conflicting moral premises), insofar as they identify what information is relevant to moral consideration, the correct language in which to express it, etc. will *entail* that an alternative set of procedures which considers other information relevant, prefers a different vocabulary, etc. is misleading or biased.

definitely a person or definitely not it seems a small step under any reasonable theory to a moral conclusion. Yet, while our classification may significantly influence the eventual moral verdict, we are inclined to think of determining personhood as a factual procedure; as something prior to and separate from moral evaluation. It seems, in principle at least, that there will be non-moral contexts in which we employ the same tests for personhood and that these tests are therefore not significantly morally weighted.

While there may be little disagreement about the appropriate moral inference concerning definite cases of personhood, there is deep and widespread dispute about the fetus' classification. Let us consider two simplified definitions, call them *scientific* and *spiritual personhood*.¹¹ The scientific definition says that an organism displaying a certain range of abilities and cognitive capacities is a person (the term *intelligence* with all its current variants (emotional, social, practical etc.) is, I think, broad enough to capture the relevant capacities). This is meant to represent the type of definition which denies the fetus the status of a person – because certain scientific tests find that it does not yet fall within the intelligence range distinctive of persons. The religious definition includes all beings endowed with souls of a particular type under the term *person* and is meant to be the kind of definition which, based on religious tests (consulting scripture, focusing on potentialities, etc.), includes a human fetus under the extension of that term.

Having something like a human soul or the potential to become a robust person and not possessing the type of intelligence specific to a normal developed human being are both aspects, we might say, of a more holistic picture of a human fetus.¹² For certain

¹¹ Again, I want to emphasize that these are simplified for the purpose of this example. I make no claim to these being robust or entirely accurate.

¹² In quantum mechanics a dual wave-particle picture is maintained, each is seen as a valid representation under certain considerations. The wave and particle pictures are each invoked to explain measurements of

obvious cases of persons and non-persons, making an acceptably accurate determination on both criteria will be possible. For borderline cases, however, I want to suggest that making a definite classification based on one consideration, say the type of soul possessed, will preclude making an accurate classification on the other – tests for intelligence will be indeterminate.

In such cases, reaching a definite verdict will only be possible for extreme positions which disregard one of the above criteria as *unessential*. Such positions, call them *strict empiricism* and *strict spiritualism*, are bound to conflict not merely on which of the criteria is essential, but also on which of their respective methods for classifying intelligence or the type of soul is objective or non-biasing. Here, it seems that asserting the objectivity of one side's methods will *entail* biases and thus interference in different ones. To defend the objectivity of his own account, the strict spiritualist will need to defend the validity of his sources and methods – scripture, religious leaders, personal revelation, etc. Where these are different than the *strict empiricist's* methodological assumptions, they will imply the illegitimacy of her own (intelligence) tests. From his standpoint, it will seem that she has ignored or contradicted some important considerations in order to arrive at her eventual moral conclusion and thus that some of her assumptions are biased *toward* it.

The bias here is inferred merely from the fact that the opposing view's moral outcome contradicts the "correct" one. Though the premises of the different positions may, in some instances, be directly contradictory, it is important to note that they are not *merely* each other's converses. Plenty of the scientist's assumptions will not be

one *essential* property, a particle model explains position tests, a wave model momentum tests. Similarly a more complete picture of a fetus would convey the fact that a fetus is both in some respects a person and in other respects not a person.

contradicted by any of the spiritualist's commitments. However, a bias might still there be inferred from the fact that these favor an alternative conclusion. It is tempting to think that the scientific biases thus "exposed" could be corrected for and that doing so within a religious framework would classify the fetus in the critical intelligence range – thus that the results of those tests do not become truly *uncertain*, but are constructed in a correctable way – but this is misleading. The extreme positions consider just one criterion for personhood important and thus only have a stake in showing how the other criterion is not a true distinguishing feature of persons. Ideally, the exposed biases will show how the other position is not in fact able to make a determinate classification because it is founded upon false or misleading premises. Like knowing the biases of the news media without an alternative account for comparison, inferring biases in scientific intelligence tests with no more objective alternative – say religious IQ tests – renders them uncertain.¹³

As already noted, a more comprehensive moral theory might recognize both of these properties, displaying a certain intelligence level and having a soul or the potential to become a robust human being, as important criteria for personhood. From this perspective, we could recognize each classification as the most accurate one following from its respective set of tests and the premises they operate on. Insofar as each property and the tests for it are seen as *complementary* (incompatible though not, in any clear sense, opposites) and equally legitimate we must consider a true classification impossible. Performing a conclusive test on one property will require that, like the "strict" adherents above, we consider the procedures for identifying it to be objective and

¹³ There are meant only to be religious tests for having a soul and scientific tests for having a certain kind of intelligence. In certain situations, very carefully measuring one property will preclude the accurate measurement of the other.

the assumptions those procedures make true and this will entail indeterminacy in the other property.

Under this model for a strong analogy between science and morality, contexts in which there is inherent uncertainty in our moral descriptions are also contexts in which, for consistency, there is inherent uncertainty in our descriptions of moral media and their interference. That it was indeterminate whether abortion was permissible or impermissible also made it indeterminate in exactly what sense different tests for personhood were biased toward a conclusion in a particular direction. The different perspectives agreed that *some* interference or bias was affecting the debate, but there was no general agreement on the character of that bias and how to correct for it. This, by analogy with quantum theory, rules out the kind of realist causal description of that indeterminacy by reference to a definite underlying structure and the mechanism by which it is observed.

If the above type of model is correct, it suggests that the moral facts in indeterminate cases are significantly constructed by the particular tests one uses to determine them. That we accept those cases as inherently indeterminate represents an inability or reluctance to stop using the tests or types of language (e.g. the term “person”) whose moral bias turns out in certain cases not to be negligible. This may imply, in turn, that such tests are always, to some important extent, constructed *in order to* adjudicate moral disputes. Where the resolution of these disputes impinges upon the outcome of a related moral issue, using such tests will importantly bias that outcome. Similarly, the accepted uncertainty in quantum mechanics probably indicated that all descriptive human language was, to some extent, visual in character. Such language or tests could be used to

classify scientific and moral phenomena so long as, approximately, assumptions about their non-interference were correct.

This semi-hypothetical example has been presented as directly analogous with the quantum mechanical case. Testing for the model's true accuracy will require an in-depth analysis of actual hard cases and to what extent they conform to this structure. It seems, however, that fixing for simplifications to include various other definitions of personhood, or making the definitions here more robust, will, only strengthen its case. If anything, the diversity of perspectives on any issue and the broad range of conflicts between the methods by which these are inferred will increase their frequency and difficulty.

V. Conclusion

It might be wondered how the above argument is importantly different from that for relativism from incompatible first premises [see Taylor]. The answer is, not at all, so long as this type of relativism is properly understood. We might have divided quantum mechanics into two sciences with a few incompatible first premises – one science founded on the legitimacy of position tests and one founded on the legitimacy of wavelength or momentum tests. Some kind of relativism would then hold between these. But these separate theories would embody so many of the same methodological and theoretical features that a comprehensive view, quantum mechanics, which concludes

uncertainty for these cases, is vastly more practical and constructive. For the case we were considering, the opposition was only extreme within a certain context. The overlap of the broader positions containing divergent definitions of personhood might still have been sufficient to warrant an encompassing theory which concludes inherent indeterminacy where they conflict. For example, we had also assumed that the different positions would probably make the same moral conclusions from a definite classification of personhood.

Taylor has suggested that true moral progress can be made by getting others to recognize their own inconsistencies (in what he calls an *ad hominem* approach). This implies that even radically divergent positions might agree on what, logically, constitutes such an inconsistency and thus on a general moral argumentative structure [Taylor 220]. Indeed, for relativism from first premises there is still always something like a correct moral argumentative structure which different sides share – deductive inferences from a set of premises.

What we conclude about this overlap, whether it is best understood as revealing something about an underlying real structure or not, is beyond the scope of this essay. The relevant question here has been whether accepted cases of indeterminacy are best explained by moral realism or moral antirealism. Boyd's analogy between cases of ethical and scientific indeterminacy and my own represent two such attempted explanations. Which model describes those cases best will ultimately be determined by an analysis of actual intransigent issues and the extent to which they confirm either one. Even if we are inclined to consider them equally strong, this will favor an antirealist interpretation of indeterminate cases. Boyd's argument is pitched against a default

antirealist interpretation. Showing that such an argument could just as easily if not better defend antirealism, brings us, at worst, back to this default position. Instead of arguing for one model with reference to actual hard cases, I would like to conclude with a couple general remarks about them.

First, what seems to count as evidence for Boyd's model also counts as evidence for my own. That attempts to alter the relevant terms in order to force a classification render those terms unnatural or misleading was predicted by Boyd's realism. By analogy with quantum mechanics too, however, making a classification required that we ignore other criteria and methods while these may have seemed just as relevant to a complete description from an encompassing perspective.

Finally, the cases Boyd considers from the special sciences seem simply not to embody the same urgency we encounter in inherently irresolvable issues in ethics and quantum mechanics. In evolutionary theory, the notion of the gene and heritable phenotypes settles the dispute over the extension of our more rough-hewn species concept. The inherent vagueness of that concept is not a pressing issue since biologists are committed to a more basic description of an organism's genetic make-up which explains the features of a hybrid case in a concrete way. One might say of the dichotomy introduced here – between belonging and not belonging to a particular species – that it is contrived; there is an alternative descriptive framework in which an ultimatum simply does not arise. On the other hand, genuine cases of ethical indeterminacy seem not to involve an alternative perspective from which an inconclusive middle stance seems reasonable. The ultimatum seems genuine and important, it is either permissible or impermissible to perform a certain moral action and people feel strongly both ways.

Those who remain undecided also still feel conflicted; they have not discovered a happy middle ground which dissolves the issue. The type of indeterminacy from quantum mechanics is similar in that the acceptance of the uncertainty principle does not somehow denigrate that uncertainty. Its interpretation is still just as troubling and serious a conceptual issue as was the debate leading up to quantum mechanics between proponents of wave and particle theories of light.

Even if the above considerations and others like them are correct and antirealism is really a more tenable position with respect to accepted cases of ethical indeterminacy, this need not warrant intellectual despair. Quantum mechanics, though difficult to stomach conceptually, is still a vastly productive scientific theory. The technological advances made from that theory while it included the uncertainty principle have been remarkable. One might argue that the practical benefits of incorporating antirealism into quantum theory outweighed any gains we might have made from modifying our scientific descriptive framework to exclude it. So too, accepting antirealism for analogous ethical cases might enhance our understanding of other pressing problems. The assertion of a definite structure underlying indeterminate ethical cases can, furthermore, only embitter the opposing sides while that structure remains obscure and, it seems, dissolve the issue once it is discovered. Insofar as we accept certain issues as urgently and genuinely irresolvable an antirealist stance toward them can promote tolerance and redirect energies toward areas with greater potential for progress.

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