Making Use Of (short abstract)

I will examine the prospects of one route into the metaphysical via scientific practice: the notion that coherent scientific practices necessitate certain commitments from scientists which we ought to take ontologically seriously. I'll develop Ian Hacking's arguments for entity realism, and Hasok Chang's recent 'pragmatico-coherentist' precisification of these ideas. The basic thought is that in particular epistemic contexts, scientists *make use of* various theories, models, entities and regularities to structure and support their inquiry and that, under some conditions, that use-making is required for those inquiries to make sense. I'll explore ways in which this kind of thought can be made to do metaphysical work for us, and sketch a research programme on that basis. I'll consider how ecological, physiological and evolutionary ideas come together in the reconstruction of past organisms—my case study will be New Zealand's extinct Moa. I'll also briefly consider whether reading success in terms of fruitfulness (as opposed to verisimilitude or convergence as Friedman might, or Chang's coherence and success) makes better sense of scientific practice (at least pertaining to the cases that interest me).

Making Use Of (long abstract)

Where philosophers have traditionally focused on the *products* of scientific inquiry, practice-oriented analysis looks instead at the processes by which such products are generated. As such, the thought that practice might be a guide to metaphysics is a surprising one. After all, scientific products are often happily characterized in propositional, truth-apt terms: scientific representations are about the world and, if true, inform us about it. Insofar as metaphysics is in the business of understanding the nature of the world, then, there is a happy match between it and scientific products. By contrast, what scientists *do*, the processes by which they come to, say, representations, don't appear to have the same character. Practises might, under the right conditions *produce* truth, but it's odd to claim that they *are* true. However, there is an argument which, to my mind, appeals directly to practice in constructing a metaphysics: Ian Hacking's argument for experimental realism.

In brief, Hacking argues that the design and calibration of experiments sometimes necessitates the existence of some properties possessed by unobserved entities, on pain of incoherence. Crucially, it is not the denizens of the hypotheses that such experiments test that we ought to be realists about, but those properties which are *made use of* in engineering the experiment. I'm interested in exploring the prospects for a generalized version of Hacking's argument, specifically, one which is more specific about what 'coherence' amounts to, and one which does not restrict itself to entities in experimental contexts.

Let's start with coherence. A purely logical sense of coherence seems inappropriate – after all, it's not obvious why I cannot simply accept that some experimental practices are incoherent logically speaking, but nonetheless happily work. We don't need to read coherence in those terms however. Hasok Chang, for instance, has recently suggestsed 'pragmatist' or 'operationalizable' notions of coherence wherein the notion turns on the combined orchestration or 'harmony' of actions in virtue of which intended results are successfully produced. He further has provided a species of contingent transcendental arguments which take us from underwriting successful research programmes to a kind of necessity. I'll develop Chang's notions by considering alternative conceptions of success motivated by the sciences I'm interested in.

In designing tests, experiments, and other ways of exploring the world, scientists do not only make use of unobservable entities. They also draw on rich background theory, construct models, scenario-build, apply various kinds of control and repetition, and so on. A generalized version of Hacking's

argument would claim that in designing and carrying out empirical tests, scientists make use of things which necessitate certain commitments about the nature of the world. To make sense of this idea, we'd need a grip on the kinds of commitments, how those commitments are necessitated, and how such claims get to be *about* the world. Let's briefly consider the latter.

Here are two ways of conceptualizing metaphysics. One approach—more familiar to analytic philosophy—divides the world into a realm accessible to critters like us, and another realm which is inaccessible, or at least not without difficulty. Metaphysical questions about ontology, then, are answered insofar as some inference ticket can be written taking us from one realm to the other. Inference to the best explanation, for instance, attempts to shift from the possession of explanatory virtues to truth. Another approach, more aligned with pragmatism and some approaches in continental philosophy, denies the separation between our actions, our knowledge, and the world—they deny the very duality which underwrites the first approach. If the world and our knowledge of it are inextricably intertwined, then no inference ticket is required to take us from one to the other.

If there is a workable account of *making use of* to be had, I suspect it will be valuable on either conception of the metaphysical project. On the duality approach, features of scientific practice may reveal the world indirectly due to how it impinges upon scientific practice. The world only bends in so many directions, and this both constrains and is exploited by scientists in their investigations. Identifying how the world necessitates certain commitments by scientists could potentially provide the kind of inference ticket required to cross from one domain to another. Naturally, on the non-dualistic view, the world scientists have access to just is the world metaphysicians are interested in. Understanding how that world structures practice (and, potentially, *vice-versa*) reveals the world more-or-less directly.

Regardless of which way we'd like to jump *vis-à-vis* metaphysics, I'll argue that considerations involving *making use of* underwrites a research agenda: identifying the ontological commitments which partially structure how scientists approach their investigations. One interesting feature of such a program is a shift away from the evidence and license of particular inferences towards a more naturally holist conception of the license of scientific inference. I'll briefly sketch how this might go, in reference to how ecological, physiological and evolutionary ideas come together in the reconstruction of past organisms—my case study will be New Zealand's extinct Moa. One striking feature of historical reconstruction is the preference for research agendas which are empirically fruitful: that is, they act as platforms form which further, deeper, empirical investigation may proceed. I'll explore whether this notion of 'fruitfulness' is a contender for 'success' (as opposed to coherence-towards-particular-goals as Chang would have it, or convergence across paradigms as Friedman would have it).