Individuation and practice are terms of art that embody a shared optimism for new directions in philosophy of science. The collection of papers in Individuation, Process, and Scientific Practice contains contemporary lenses on a traditional problem: Individuality in the sciences has come a long way from Leibniz and Hume. While often traditional notions work in the background, such as identity, boundary conditions, composition of parts, structural unity, etc. there are other features of individuals less metaphysical in tone, such as tracking individuation practices and experimental creation of individual objects and processes. While all authors track their sciences of interest, methodological differences shape the directions of analysis.¹ This is a main thread weaving through the anthology, which I’ll highlight, followed by a brief critique concerning some old pillars of philosophy of science that appear to haunt the turn to individuation practices across sciences, and some thoughts looking forward.

The papers are organized in a way that reflects conceptual and methodological differences for philosophers of science. Part 1 “Aspects of Individuation: Metaphysical and

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¹ While I hesitate to comment on gender identity by genderizing names and google searches, to the best of my knowledge there are only three papers by women out of twelve entries in this collection—one for each section. This does not seem to be representative of women working on the topic. I find the continued underrepresentation of women in publications tiring, especially when approaching a contemporary area like this. And so, I intentionally comment on those three papers a bit more than others in order to foreground their contributions.
Processual” contains more conservatively metaphysical approaches while still adhering to a new scientific metaphysics that works to glean ontological implications from scientific cases. There is an emphasis on process metaphysics: Dupré (p. 23) introduces process in contrast to substance ontologies; generally, substance ontologies consist of organisms, seek to explain change, and pair well with monism, whereas process ontologies draw from processes (e.g. immunogenic response and metabolism), seek to explain stability, and, as Dupré insists, intertwine with pluralistic ideals. Pemberton (p. 53) dives into individuating processes and the tensions between scientific views of processes and the metaphysics of things, for example. However, part 2 “Experimental Practices of Individuation” takes a predominantly epistemic turn towards following and accounting for the practices of scientists in laboratory settings, such as the difficulty in experimentally individuating stem cells (Fagan, p. 119). While the book begins by working from science towards an informed scientific metaphysics, it shifts to epistemically accounting for and explaining the successful practices of science. Finally, and rather strangely, Part 3 stands out as something of an afterthought. It contains a realism versus anti-realism thread uniting the last few papers on what we can say about individuals of science-x as really existing or not.

One common endeavour is how individuality, or perhaps better, individuation is explored against the different ways theory and practice are related to monism and pluralism. This is part of what makes the book timely—a hot topic (i.e. individuality) is aligned with trends in philosophy of science (i.e. practical pluralism). While trendy, the collection is executed to showcase each author’s expertise in terms of what they are (or are becoming) well-known for. This includes, for instance, Alan C. Love and research programmes/problems, Marie Kaiser and
parthood, Melinda B. Fagan and stem cells, and C.K. Waters and purposes. Despite this, I can’t help but worry about a crosscutting tendency permeating the entire book. The collection adheres to philosophy of science’s traditional pillars left to us from early modernists, positivists, and their aftermath. Yet, in the introduction there is clearly an aim to break away from ways philosophy was done in the past:

“Foregrounding the individuation process in effect reformulates the classical question of individuality...this plurality of formulations offers distinctive characterization of the problem of individuation, which accommodates the diversity of scientific practices and their individuated results” (p. 10).

Perhaps this depends on how far back one wants to cut the classical cord, but I’m not sure they go far enough. Empiricism versus stripes of scientific realism have an entire section dedicated to their plight (p. x ff). And metaphysical “common sense” conceptions of individuality (e.g. composition, structural unity), etc. are pervasive through most entries. Common sense conceptions are sometimes highlighted as in tension with practice, such as Pemberton (p. 59) who contrasts metaphysical notions of individuals with scientific treatment of processes. Or alternatively common sense, intuitive conceptions of individuality frequently serve as guides or starting points to analyze practice, such as parthood, boundaries, and identity. For example, Kaiser’s entry (p. 65) on biological parthood aims to extrapolate a general account of parthood from practice. And often the use of boundary and identity conditions—traditional intuition pumps for thinking about individuals—are applied in different contexts: Fagan (p. 116) assesses stem cells against whether a stem cell can be consistently “picked out from its environment, and distinguished from others of its kind.” And Millstein (p. 292) grapples with the well-
boundedness and interaction strength of components in ecosystems. Therefore, even as philosophers get closer to practice it’s tough to shake the foundations on which we stand: Perhaps relying on the pillars of past analytical thought is more of a barrier than a pathway.

Practical accounts of individuation that closely follow science are motivated by explaining scientific success, especially the success of experimental sciences and laboratory work. Of course, generally part of what motivates the practice turn in philosophy is its potential to explain successful science. However, conceptualizing about individuation practices insofar as they help or hinder science is a “safe” reason to care about the practice turn in individuality because it harkens back to a core feature of philosophy of science taught to undergraduates—explanation. And so, even in a topic promising to grind down to the bare activity, motions, and practices of scientists still results in philosophy reflected back unto itself. I’m hesitant to extend congratulations for moving closer to the water when there is still a real need to dive right in leaving old ideas on the shore.

I say all this while acknowledging the valiant effort of this collection to show what conceptualizing about individuation practices, rather than about individuality from the armchair, means in different scientific contexts. There is consistent discussion of tracking or attempts to find principled analyses of tracking activities, which presumably lead to how practices of individuation are effective in scientific work. This is a turn towards activity and away from the run-of-the-mill theorizing of scientific representation, theories, observation, prediction, etc. Notably, Griesemer (p. 147, 149) works to tie concepts of individuality to empirical processes and tracking practices of individuation in terms of what kinds of assignments investigators make to track items of interest. And this isn’t the only place tracking
comes up (see Chen, Love, and Bueno, as well as Fagan who looks at how stem cells are tracked in different experimental contexts). A principled analysis of tracking activities avoids a level of capriciousness that individuation practices in science threaten to produce; certainly scientific success cannot be explained by individuating according to haphazard lacks of constraint. It must be according to some purpose (see Waters, p. 111) or for some reason, be it experimental or not. However, I have suggested we can go even further afield from the philosophical canon that still appears to haunt this collection. But how?

Looking forward, philosophers working on individuality need to think about what’s missing and what’s at stake. On the one hand, a clear gap concerns individuation in the social sciences. While most philosophers of physics, chemistry, and biology are worried about the basic carving techniques of scientists, what’s forgotten is the richer sense of individuality psychologists, sociologists, anthropologists, and historians might be concerned with. These disciplines might contain different senses of individuality—i.e. basic slicing-up of concepts and the world compared to richer more humanistic accounts of self-identity, agency, and meaning (see McConwell “Two Senses of Individuality” in A Philosophers Take)—and by that token different individuation practices, whatever that could amount to. On the other hand, what’s at stake empirically in the individuality debate was previously criticized by Karen Kovaka (2015, “Biological Individuality and Scientific Practice” in Philosophy of Science). And while turning to practice might get closer to why individuality or individuation matters, it’s not clear yet how it

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matters outside of our foundational philosophical vacuum. Sure, scientific success might be explained insofar as it matters for philosophers, and perhaps metaphysical robustness is gained from such a bottom-up methodology. But clarity is needed concerning how questions of individuality make a tangible difference or why individuation matters for the lives of scientists and the everyday lives of persons more generally. This will be the point at which philosophy, and philosophy of the sciences specifically, ceases to alienate itself from its objects of study.

Overall, I recommend this book for philosophers of all sciences as a touchstone for the individuality debate’s past and future directions. It’s tempting to follow the path of least resistance even when breaking new ground, but perhaps in a topic so deeply rooted in philosophy we need not worry about minimizing impact to traditionalists criticizing the practice turn. Building a new trail involves anticipating what others will do and surveying areas around the potential route. I view this collection of papers as doing exactly that: it does the tough work of opening the possibility space for how to move forward, while at the same time identifying what might need to be left behind.