Interdisciplinarity and the Dilemmas of Knowledge

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4.1 Disciplinarity, Interdisciplinarity and Transdisciplinarity

> The most thought-provoking thing in our thought-provoking time is that we are still not thinking.
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> Heidegger, *What is Called Thinking?* (1976, p. 6).

This chapter explores the underlying issues that affect attempts to make one's research relevant to wider-than-disciplinary audiences. It does so via reflections on the nature of interdisciplinarity, the growing contradictions of the modern university and the future of knowledge production generally.

Overall, the chapter offers an *environmental* critique of knowledge production within the contemporary university. This critique is environmental in the sense that knowledge production in the modern university is unsustainable. Sustainability is commonly defined in terms of the three parameters of the economic, sociological and ecological limits to growth. Today, a fourth parameter is needed: epistemic sustainability. Epistemic sustainability recognizes the problems of endless disciplinary knowledge production, and entails redirecting our focus towards the blending, contexualizing and translation of already existing knowledge for societal needs. This is the definition of interdisciplinarity that is worth defending.

4.1.1 Interdisciplinarity

Discipline is something that parents impart to their children for an ordered life. Discipline is also needed by anyone who wants to master an art or craft.

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Within an academic setting, discipline means the standardized method of a particular line of inquiry, as well as the administrative structure of the modern university. In recent decades, there has been a growing sense that disciplinarity is in need of revision. Calls for interdisciplinary approaches to knowledge have become obligatory. In some cases, however, they consist of little more than a proclamation of the relevance of one's research. And even when their claims go beyond mere posturing, advocates of interdisciplinarity can mistake what is at stake.

The most common error is to confuse interdisciplinarity for transdisciplinarity. Quite often, the former term is substituted for the latter. Interdisciplinarity identifies the blending of different types of academic knowledge. Transdisciplinarity points to something quite different – a move beyond solely academic actors, whereby one's epistemic efforts are made in concert with one or another part of the public. Transdisciplinarity thus marks a political as well as an epistemic change, for it implies that academics are giving up some of both their authority and autonomy.

If one is cynically minded, the slippage between the two terms looks like no accident, for it allows what sounds like a commitment to greater relevance to become just another occasion where academics produce knowledge of no particular use to the wider world. Interdisciplinarity – the blending of different disciplinary perspectives – offers no guarantee of wider societal relevance. Nor would such fraudulence be surprising: few people willingly give up either their authority or their autonomy.

The switch in terms also points towards another issue: the discordance of ends between academics and non-academics. Teaching aside, academics understand their job as consisting of the production of new knowledge. Non-academics have a different priority: getting the job done. They have limited time or interest in acquiring additional knowledge unless it directly helps them with their task.

The muddle surrounding interdisciplinarity starts with the root term, disciplinarity. To a remarkable degree, given the fact that academics seek to interrogate everything, the concept of an academic discipline goes unanalysed. Inhabiting a discipline is treated as simply a background condition; real work goes on at the subdisciplinary level, as academics specialize and specialize again. Raise wider questions about the future of the university, or the future of knowledge generally, and people beg off: it is not their research focus. And given the structure of the modern university, it is not anyone's research focus. After all, such research might demonstrate the pointlessness of further research. (Granted, a few fields raise such questions: social epistemology sometimes does, and so too interdisciplinary studies. It is also occasionally discussed in education departments, and there is even a new field called critical university studies. But, as with more traditional disciplines, the dynamic of all these fields drives them towards more detailed research questions, a process I have called 'disciplinary capture'.)

As a result, larger questions of the overall purpose and direction of disciplinary knowledge, and of knowledge in general, are neglected – or at least, not asked in a serious way, treated as a matter of sustained study (cf. Frodeman and Briggle, 2016). This is the point of the opening quote from Heidegger (1976): for all our research, in what is undoubtedly the most knowledge-intensive culture in history, we are still not asking the most basic questions concerning thinking. These might be boiled down to two. First: in a given situation, what is pertinent knowledge – knowledge that could make a difference to the larger world, rather than merely satisfying one's professional curiosity? Second: is knowledge even pertinent to the problem at hand? Or is the further pursuit of knowledge an excuse for not facing up to the need for making a decision or changing our behavior?

Another reason we do not interrogate our disciplinary assumptions: the tacit belief that there is some type of epistemic core that unites the disparate parts of a discipline. Here we fall prey to the fallacy of composition, which assumes that when the members of a collection all share a property, the collection as a whole must possess that property as well. Academics are housed within a given discipline and all pursue knowledge of one type or another. But this does not mean that there is an overarching epistemic unity to the discipline. What core epistemic qualities do a mineralogist and a palaeontologist, both in geology, share? Or a physical anthropologist and a linguist, although both study anthropology, or a symbolic logician and an ethicist, both housed in philosophy? I have argued elsewhere (e.g. Frodeman, 2014) that disciplines are defined by social, economic and administrative factors as much as by epistemic ones. Certainly, there are barriers to working across disciplines, but these are as much institutional and linguistic as epistemic in nature. Disciplines are historical accretions that shift over time depending on a variety of social and economic influences. But if disciplines already consist of distinct epistemic elements, it is not clear what interdisciplinarians bring to the table that is unique.

Of course, this point is a matter of degree. There are close connections between stratigraphy and sedimentology, just as there are between Renaissance and Enlightenment historiography. And on the other side, we can find clear cases where a physicist and a philosopher are engaged in interdisciplinary (although not necessarily transdisciplinary) research. But by what measure could we determine that the theoretical distance between two researchers in different disciplines is greater than the distance between parts of a single discipline?

4.1.2 Narrow and wide interdisciplinarity

Given the structure of the university, it is important to distinguish between what can be called narrow and wide interdisciplinarity (Frodeman *et al.*,

2001). The former occurs so regularly that it attracts little notice: think of a chemist and a physicist working together. The latter involves crossing the divide that exists between the natural and social sciences on the one hand and the humanities on the other – between a discussion that is primarily concerned with the way things are versus the way things should be.

This point was once commonly described in terms of the fact–value distinction. But this way of describing the divide is passé. We have learned that every fact-based inquiry presupposes value judgements concerning what issues are worth examining, as well as the manner in which they are examined. Conversely, every value discussion relies on one or another set of facts. Nonetheless, the question remains whether these points are operationalized: whether the ethical, social, political and aesthetic dimensions of an issue are married to the facts that both constrain and open up opportunities for the resolution of a problem.

In closing this section, allow me to emphasize my main point: interdisciplinarity largely functions as a slightly more adventurous form of disciplinarity, when what is needed is a wider questioning of the premises underlying both. Disciplinarity, interdisciplinarity and transdisciplinarity are species of a larger genus. This genus is our knowledge culture; this is what needs a thorough rethinking. When this finally occurs, the attention now given to interdisciplinarity may be seen as a passing phase in the evolution of our knowledge culture.

4.2   The Assumptions of Our Culture of Knowledge

Questioning our knowledge culture has not occurred because academics are committed to the disciplinary status quo. They are good at what they do – narrowly focused research designed to be of interest to their colleagues – and fear that any change in their circumstances will be a change for the worse. In this, they are probably correct. Despite the growing problems within the contemporary university (declining public funding, exorbitant tuition fees, the move to online education, research that goes unread, increasing administrative burdens), the professor's life remains a privileged one. There is teaching to be taken care of, and an irritating amount of administrivia, but then you are free to pursue whatever research you find interesting – with little regard for whether there is any particular demand for your research.

While these assumptions are being challenged in some quarters, there is a substantial amount of inertia to the system. A precipitating event is probably necessary before the assumptions of the modern research university will seriously be called into question. The COVID-19 pandemic may be that event. I am writing in the midst of the pandemic and claim no particular skill at soothsaying. In fact, it could be the better part of a decade before it becomes clear whether the COVID-19-driven changes in

academic life will be trivial or profound. But there are already signs that the status quo ante of university life – in-person classes, tenure, the never-ending circuit of academic conferences and the endless production of new knowledge – may be over at many institutions. Indeed, some of these institutions themselves may come to an end. It is worth speculating on the direction things could take.

4.2.1 Knowledge generation

Let us begin with a point that is too often passed over: in terms of formal structures – setting aside craft know-how and folk wisdom – disciplinarity has defined our thinking about knowledge only fairly recently. The creation of the modern research university, which can be dated from the founding of Johns Hopkins University in 1876, made disciplinarity inevitable. The central mission of the university shifted from the preservation of our cultural inheritance to the discovery and invention of new knowledge. Producing new knowledge required disciplinary specialization, for only by focusing on greater and greater detail would continued progress in knowledge be possible.

The modern research university, then, is built on two interdependent assumptions:

1. Knowledge production is an infinite project.
2. Knowledge is flat: no discipline is more fundamental than or superior to another.

These assumptions are so deeply embedded in academic culture and society at large that they are not even subject to debate. When I raise them in talks, I am greeted with disbelief. Take the first point: why would anyone want to stop the pursuit of knowledge? Surely, we want to grow the economy, conquer disease, address environmental problems and generally improve the human condition? To state such goals in a piecemeal fashion, as disciplinary researchers and the public do, makes the point obvious. Of course we want a vaccine for COVID-19 and a cure for cancer, more efficient solar power and better battery storage, more powerful computers and a faster Internet. The list is endless, as are our desires. But there is something missing from this account. Return to our earlier discussion of the fallacy of composition: where does this piecemeal process take us when considered as a whole?

4.2.2 Transhumanism

The movement known as transhumanism (which advocates the transformation of the human condition through technology) provides an answer to this question. Having thought through the knowledge enterprise as a whole, transhumanists offer an account of where advances in science and

technology will eventually take us: to a condition of nearly infinite human power. Transhumanists differ on the particularities of this process – it may come through the physical and cognitive augmentation of our simian bodies, or through a silicon future, as artificial intelligence comes to either serve or absorb us. But by whichever means, the end result is the same: something close to deification.

Transhumanism is dismissed as the passion of a few oddballs. This is a mistake: rather than an aberrant interpretation of science and technology, the transhumanists have spotted something important. They have correctly diagnosed the tacit agenda of modern culture. Whether judged in terms of capitalism, or the ideology of continual scientific and technological progress, or simply the nature of human desire, our culture's love of infinity is tacitly transhumanist in orientation. Transhumanism makes explicit the logical end point of the Enlightenment project of *sapere aude* (Frodeman, 2019). How else should we describe the pursuit of scientific and technological progress that has no end? The US National Science Foundation places no limit on its programme of scientific and technological advance, just as the US National Institutes of Health seek to overcome every human infirmity. The same is true for every other nation's research portfolio. The only difference between the transhumanists and the rest of us is their self-awareness. Our trajectory points towards deification on the instalment plan; transhumanists have simply made the point explicit.

Transhumanists deserve praise for achieving a global view of our situation. But this clarity raises a new set of questions, the most basic of which is whether we are taking the dangers of continued knowledge production seriously enough. The perpetual pursuit of technoscientific knowledge will lead to any number of improvements. But as our knowledge increases so does our power, which, like the Sorcerer's Apprentice, is liable to spin out of control. This raises terrible possibilities – of political instability, as society fails to properly integrate new technologies; of totalitarian government, as advances increase the means for surveillance, manipulation and control of the population; and of social or environmental disruption, via catastrophic accidents or the deeds of rogue actors.

Most basically, transhumanism highlights the fact that the overall results of knowledge production may be quite different from the piecemeal outcomes of these efforts. The dismissive response transhumanists have received by sober-minded science and technology policy analysts reflects the latter's focus on the piecemeal aspects of our knowledge culture. This is what Heidegger meant by the 'forgetfulness of being' – the loss of a view of the whole, and a sense of our overall trajectory, as we focus on smaller matters. Our university system, which has the same structure across the globe, possesses no unit whose task is to consider the whole of knowledge – except in terms of administrative functions, where functionaries attend to the practical necessities for keeping the universities running.

When Heidegger claims that we live in the age of technology, he is not primarily interested in the machines and instruments that surround us. Rather, he is concerned with a way of life that focuses on means to the exclusion of ends. The nihilism of our culture, which Postman (1985) described in terms of 'amusing ourselves to death', is visible in the fact that talk about the ends of life has become irrational, reduced to questions of personal preference. Ours is a technological age not because of cars and cell phones but rather because rationality has become instrumental in nature with no larger goal in mind.

4.3   The End(s) of Knowledge

> In the multiversity there is an irreducible plurality of communities, functions, disciplines, and interests, external constituencies, agendas, and beliefs.
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> Marginson, *The Dream is Over* (Marginson, 2016).

This brings us to the second assumption of contemporary knowledge culture: knowledge is flat. No discipline is subordinate to or preparatory for any other; no discipline represents the end point of knowledge. The university is a self-serve buffet where everyone selects what they want. This is why Clark Kerr, president of the University of California system in the 1950s and 1960s, described the modern research university as a 'multiversity' serving a vast number of interests and constituencies. In other words, the university is a space for knowledge but not for wisdom – if wisdom is understood as a non-relativized claim about the nature of human flourishing and the ends of life.

4.3.1   The goal of the medieval university

Compare the multiversity with what came before. The crucial difference between the modern research university and the medieval university concerns the relationship between means and ends. The medieval university understood that knowledge must have an end in the sense of a goal, and thus would have an end in the sense of a terminus or completion. Rather than being flat, in the medieval university knowledge was hierarchical in nature. Individual knowledge projects were not independent but rather were seen as contributing to an overall goal.

This was reflected in the structure of the medieval university: the division of professors into higher and lower faculties reflected the fact that some types of knowledge were subordinate to others. The three higher faculties of medicine, law and theology trained people for professional roles in society. These faculties were arranged in ascending order: the health of the body was important, the laws governing the polity still more crucial, and the destiny of our immortal souls of supreme consequence. There was a lower faculty as well, consisting of the arts or philosophy, which had their own worth as well as offered preparatory training for the higher degrees.

The meaning of these terms shifted over time. In the medieval university, 'philosophy' was not disciplinary in nature; it included what we now call the natural and social sciences as well as the arts and humanities. 'Natural philosophy' was not merely the name for a more primitive natural science; the natural world was studied for many reasons, but chief among them was the theological goal of understanding God's work and overall plan and our place in the universe. Similarly, the social sciences evolved from moral philosophy, but differing from today's social sciences moral philosophy was normative, and had a clear pastoral element, with an explicit focus on training young men to be virtuous, motivated by a sense of *noblesse oblige*.

The medieval university possessed administrative units, and some of the designations remain the same as ours. But knowledge in the medieval university was not disciplinary in nature. In a lengthy career, a professor could begin in law, move to the faculty of medicine and finish his career in the faculty of theology (Clark, 2006). New discoveries were welcome, but knowledge was essentially conservative in nature: the bulk of efforts were directed towards preserving and passing down the hard-won cultural inheritance that had been achieved across the generations.

In contrast, in the modern university, the acquisition of knowledge is an infinite process because the human desire for power is infinite. The use of this power is essentially libertarian in nature: individuals are free to turn the knowledge gained in whatever direction they desire. What explains the shift to a libertarian approach to knowledge? One account sees it as tied to Enlightenment values and the march of human freedom, where dogmatic Christian claims concerning the *summum bonum* were thrown off and questions concerning the nature of the good life were individualized. People should be free to do what they want with their lives, subject to the minimal condition described by John Stuart Mill in *On Liberty* (Mill, 1859): his harm principle claims that people should be free to act however they wish unless their actions cause harm to others.

4.3.2 The assumption of abundance

'Unless their actions cause harm to others': this brings us back to environmental sustainability. There is a hidden environmental premise to Mill's argument: it assumes the existence of ecological abundance, a 'new world' (i.e. the Americas) to explore and exploit, where there is enough room and resources that people can agree to disagree about fundamental issues. Under conditions of scarcity – of land and resources, which can be polluted without consequence – there are very few actions we can take that do not significantly affect others. These conditions will only become more stringent in an increasingly populated and developed world.

The vaulted pluralism of contemporary culture, where we assume the existence of irreconcilable differences in life plans, presumes that we do not find ourselves in the situation of the inhabitants of a lifeboat. If we

are to survive, there needs to be a fairly exacting set of values applicable to us all. The modern university, then, has been built on the ecological assumption of abundance. The libertarian approach to knowledge, where all knowledge can be treated as a means to whatever ends an individual wishes to pursue, assumes an infinite world where we do not need to consider how individual decisions contribute to the whole. But where the whole was once Christian in nature, today it is ecological in nature, as resource shortage, pollution, climate change and the rights of beings other than humans need to be balanced with our desires. Knowledge production does not exist in a vacuum; it opens up opportunities that impinge on the lives of others, both human and non-human.

Which brings us to a final word about the field of animal welfare science. In this discipline, as in others, there will be a significant amount of research at a small and discrete scale that should go forward, where concerns with the larger issues outlined here will not intrude. But at points – impossible to identify beforehand, and thus the possibility must always be kept in view – researchers in animal welfare science will need to consider how their work contributes to the overall goals of an environmental civilization. We can no longer rely on the *laissez faire* assumption that knowledge produced in one or another area of research will naturally combine with other types of knowledge in a benign fashion. Nor can we assume that research is itself an infinite process – and will be infinitely paid for by society. As we pursue our individual projects, we need to keep an eye out for the good of the whole, and to recognize that our work will increasingly consist of translating already existing knowledge for different audiences rather than the single-minded pursuit of new knowledge.

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