

# Chapter 12

## Expert Not Specialist: Doctoral Ecologies for Focused Frogs and High-Flying Birds



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**Abstract** This chapter commences with an etymological exploration of key terminologies which are necessary to (or unavoidable in) discussions of the PhD, university research, experimentation, knowledge and wisdom. The etymological filigrees and histories of these words remind of us significances, which may have been lost in time or in the busyness of higher education. To experiment is to experience, to become a doctor is primarily to become a teacher and an instructor. The chapter then turns to the interrelations between wisdom, ecology and complexity and the challenges entailed in bringing experiential knowledge and wisdom, which are the intended outcomes of advanced study – such as the PhD – to the problem of the environment. Drawing on a range of thinkers, including Dawkins, Bateson, Benjamin and others, the chapter finally settles on an ecological metaphor – drawn from Freeman Dyson – that of the focused frogs (working on one disciplinary problem at a time) and high-flying birds (capable of soaring above the problems of individual disciplines to see the larger patterns between them) to imagine a hybrid creature capable of both modes of inquiry and to pose challenges to educators to produce the conditions necessary for these hybrids to thrive.

### Introduction

This book has arisen from the editors' observation that, on a global scale, two notes of crisis are currently resounding off each other: (1) first there is the note that education in universities, particularly research-based education at the doctoral level, is failing many of the students who undertake it as well as the society that auspices it; and (2) there is the alarm that the ecological systems that host every vital activity on the planet – education included – are close to collapse.

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While research students are routinely taught that correlation does not necessarily mean causation, in this instance intuition cajoles me to investigate how entangled the two crises might be, how the fixing of one might involve the fixing of the other. It's the global nature of the problems, as well as the concomitant need for a comprehensive system-assay of contemporary knowledge-production, that puts the two crises together. Examining the connections between the educational and the environmental distress will take us into complexity theory and ecological accounts of consciousness. But first to help us understand the concepts that animate some of the keywords we use habitually, it is helpful to pursue some etymology.

## Etymology

We should start with **knowledge**, that thing (or is it a *state*?) which educators try to lead their students toward. In the Australian Federal Government's policies concerning publicly funded research, knowledge appears to be a given thing that glows in common sense:

Research is defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings. This could include synthesis and analysis of previous research to the extent that it leads to new and creative outcomes.

This definition of research is consistent with a broad notion of research and experimental development (R&D) as comprising of creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications (Australian Government 2012).

A close reading of this definition shows that in the systems that govern university research cultures, knowledge has an operational connection to understanding; and while they are often assumed to be synonymous, knowledge and understanding are crucially different even as they are both legitimate outcomes of the research-driven education that is enacted during the pursuit of a PhD. With the English word 'knowledge', deriving from the Greek 'gnosis', there is a sense of an external force or radiance, something powerful out there, explicit and independently existent. A noumenon that can also be regarded, paradoxically, as a pre-existent phenomenon, knowledge can be construed as an external, stockpiled entity which a seeker can approach and imbibe. Potentially, the seeker can bring some enhancement to it too. There is a sense that knowledge can be thickened, as it were, *from the outside*. No matter whether it is pure or applied, knowledge is an object that can be appliquéd so that it grows, increment by increment.

Understanding is different. Understanding is a good deal more subcutaneous. Understanding so saturates the seeker that it gets inside them, becomes implicit, becomes intimate. The word 'understanding' actually visualises the concept: the seeker gets immersively close to the noumenon, so close as to stand under it, so

overborne as to be enveloped in it as if in a rainstorm. ‘Comprehension’ – the direct synonym for understanding – has a similar connotation. Deriving from the French ‘comprendre’, comprehension is a process of taking or grasping (‘prendre’) an element with (‘com’) another element with another element with another element, until the seeker and the comprehensible phenomenon begin to be in and of each other, immersed in each other’s grasp. There is a sense that understanding thickens *inside* the seeker. Thus, it is different from knowledge. Only when the absorbed, implicit qualities of understanding get explicated to become an externalised entity can understanding be figured as knowledge. For the best and most influential exposition of these notions, see Polanyi (2009).

This distinction is important because it shows how experience is crucial to the accrual of understanding and therefore to the generation and eventual communication of knowledge. Etymologically explained, experience is the process of going out (*ex*) into the world-not fully-known, where risks (or *perils*) abide and where learning is availed. In the process of gathering experience, of being tuitionally immersed in the perilous flux of the world, the venturer can begin to understand or become inculcated with some principles of the larger world. The tuition can make intuition, which can be explicated as knowledge. By grasping principles via immersed investigation, the venturer can become an expert, someone who has emerged from experience.

Notably, the French infinitive for ‘to experiment’ is ‘experimenter’. Which helps us understand that the expert researcher is someone who has been fashioned in experimentation. Expertise can be garnered in the social scientist’s observed ‘field’ of investigation or in the laboratories of the hard sciences or in the studios of the creative arts or in the libraries and archives of the humanities. The point is that these domains all serve as concentrated versions of the world-that-must-be-known; and the investigator’s task is to plunge in so as to absorb, synthesise and then emerge to communicate fresh insights from that world.

So, a researcher is an experimenter. The researcher must range through the world in order to discern its often-covert patterns, to trace the implicit activity-meshes that put an integrated vitality into the system that hosts every phenomenon and noumenon. This emphasis on experience is important because it leads us to the gist of the PhD: wisdom. For the moment, let me define ‘wisdom’ thus: it arises from an investigator having encountered, accrued and then synthesised an extensive understanding of the dynamics in existence. A Doctor of Philosophy is someone who is so inculcated and expert in a topic that they have been fortified with wisdom, so much so that they can teach (‘docere’) others how to experiment, how to venture into the perils of unknowing while enacting an enamoured (‘philo’) devotion to wisdom (‘sophia’). By definition, a wise person has experienced a great deal, which means they have begun to grasp the tendencies in the systems of existence, and from that state of inculcation they have begun to understand how to proffer informed visions of what might transpire in the future as the ramifications of every single worldly action shimmer reactively through the tensile integrity of the lively world.

I have traced this etymological filigree so we can see a fundamental characteristic of the Doctorate of Philosophy: with all its centuries of history dating back long before the enlightenment, and notwithstanding its recent cladding in the verbiage of

skills-acquisition and employability, the PhD remains a self-fashioning ordeal or apprenticeship that is designed to *accelerate* a scholar's investiture as a wise, integrative type of expert. Over an extended duration and usually by dint of some ordeals designed to stimulate personal transformation, this acceleration occurs via repetitive experimentation governed by experienced supervision. On graduation, a PhD graduate should be a person steeped and galvanised with a good modicum of wisdom; the doctor should have become a significantly experienced person capable of teaching others how to venture into cognitive peril.

## Wisdom, Ecology, Complexity

Having threaded this etymological line from 'understanding' via 'experience' to 'knowledge' through to 'wisdom', we can begin to grasp how the PhD has always been amenable to the investigation of the complex, globally scaled problem of environmental collapse that roils around us today. Due to its nature as an extensive network of complex urgencies skittishly governed by a system-wide feedback-behaviour, the global ecology needs people who can connect their expertise to form a multi-disciplinary community that considers the full, dynamic extent of the environment. This collegiality is needed so that we can attain an overview or holistic understanding of how the dynamics are tending to play out across the changeful world of experience.

Diversity within collegiality is necessary because, frankly, one can never be sure where the disruption (or indeed the amelioration) may be residing ready to course within complexity, which is always tensed to fall out of balance. Each node of expertise must know how to partake of a vibrant network of expertise in order to harvest full-coverage information from the whole system and in order, concomitantly, to propose interventions that could ramify beneficially across the entire environment. The crisis needs a community of connected, outreaching experts, not a grid of specialists whose intensive focus prevents them from seeing the dynamics that tend to surge in a non-linear or networked fashion, moment to moment, across disciplinary boundaries, in the numberless, emerging directions through the complex dynamic system of the living, human-inhabited environment. For more detailed discussion of these ideas, see Millgram (2015). In the current environmental emergency, we need people whose training directs them to merge or extensify rather than intensify. And we need people who are amenable to receiving and acting on insights gleaming in from outside their nodal expertise. Expertise needs to be not only absorbed and centripetal but also curious and centrifugal. For the sake of system-wide vitality, expert intelligence needs to be relational rather than segregational.

A text crucial to such thinking is Gregory Bateson's *Steps to an Ecology of Mind*, which first appeared in 1972. Assembled well before the notion of 'the anthropocene' was abroad, *Steps* is a book that, despite its frequent opacities, resounds ever more forcefully through contemporary experience. It resounds because it tries to draw its readers into a larger systemic comprehension, into an 'immanent' intelligence

which Bateson calls ‘Mind’, which he asserts is a mentality that shimmers through all the worldly vitality with which human beings interact.

Contemporaneous and consonant with Fernand Braudel’s writing on the historical *mentalités* in Europe, but emerging from radically different scholarship, Bateson is one of the first thinkers to advertise the cybernetic idea that there is a friction-free, global galvanism of thought-and-feeling that self-organises, evolves and devolves like an ecology. (Aspects of this idea would be powerfully simplified as ‘the meme’ by Richard Dawkins during the 1970s.) ‘The individual mind is immanent but not only in the body,’ Bateson contends, ‘it is immanent also in pathways and messages outside the body; and there is a larger Mind of which the individual mind is only a subsystem. This larger Mind is comparable to God ... but it is still immanent in the total interconnected social system and planetary ecology’ (Bateson 1972, p. 467). When any one person is thinking with their own mind, they are already immersed interactively in the larger Mind, which is the dynamic set of systemically governed contingencies that render our host environment both vital and fragile, both nutritious and pernicious. As Bateson asserts, the ‘lack of systemic wisdom is always punished. We may say that the biological systems – the individual, the culture, and the ecology – are partly living sustainers of their component cells or organisms. But the systems are nonetheless punishing of any species unwise enough to quarrel with its ecology’ (Bateson 1972, p. 440).

‘Lack of systemic wisdom is always punished’. For all its Old Testament tone, this statement focusses the modern scholar’s mind on what is to be done, right now, with wisdom. ‘Wisdom I take to be the knowledge of the larger interactive system – that system which, if disturbed, is likely to generate exponential curves of change,’ says Bateson (1972, p.439). So, wisdom is the ability to see holistically and to improvise beneficially within flux. It is the faculty that we must apply to the management or the amelioration of systems that we inhabit and that are complex, ever-emerging and often-devolving. Systems such as the global ecology. Systems too, such as tertiary, research-based education.

Walter Benjamin’s essay on the art of the storyteller helps us understand better the broad efficacy of wisdom. As he observes, wisdom results from accumulated experience. And much of that experience can be ‘passed on from mouth to mouth’ via reiterative narrative accounting (which Benjamin’s English translator Zohn calls ‘counsel’). ‘Counsel woven into the fabric of real life is wisdom,’ he proclaims (Benjamin 1995/2007, pp. 86–7).

In Benjamin’s view, training in the acquisition of wisdom within European cultures was at its best during pre-modern, journeyman-training. Before the advent of the printing press, this was an oral culture that organised artisanal guilds. In artisanal pedagogy, trainees engaged in daily, hands-on fabrication; but more importantly their activities were threaded through, day after day, year after year, with stories or counsel narrated by the master, counsel that dramatised specific, palpably imaginable instances of the improvisatory, material poesis that had to occur within the peril of each unprecedented instance of creation-from-raw-materials. A master leather-worker, for example, might tell a dozen stories about a dozen different commissions in a dozen different climatic conditions using a dozen differently behaving

swathes of leather. Absorbing this tangle of accounts across days and years, the trainees would begin to curate within themselves many lively scenes of structured plausibilities-and-possibilities: events that had happened, events that might happen. Thereby the neophytes deepened their understanding of all the variabilities that must be factored into the risky process of converting raw and volatile materials into finessed products.

Over time, interweaving hands-on experience with ears-on narrative counsel, the neophyte could become expert and wise. Adaptable, trained to be innovative and improvisatory, the wise expert would not be so specialised as to be bamboozled by variances in materials and by unprecedented contingencies in each new work context. Trained into wisdom, the master-artisan could reach past preceded normalities, into a complex world of possibilities so as to imagine the right course of action. This right course of action, which would sometimes be unprecedented, would get envisaged in a process in which stored histories (experiential records indicating plausibility) and imaginatively charged stories (prospects of possibility) are brokered into practicable commission. As Benjamin declares, ‘counsel is less an answer to a question than a proposal concerning the continuation of a story which is just unfolding’ (1995/2007, p. 86).

‘A story unfolding’: This, according to Paul Cilliers, is the key to understanding and negotiating complexity. In his increasingly influential book *Complexity and Postmodernism*, Cilliers explains how a complex system ‘cannot be reduced to simple, coherent and universally valid discourses’ (1998, p.130). Neither stable nor objective, complexity emerges and evolves systematically within and around every entity that is participating in it.

Consider ecologies, for example. To begin understanding a complex system such as ecology, Cilliers observes, you must get inside it, thereby diminishing your distance from it so as to stand a chance of comprehending some of it; then you must ‘repeat’ the system virtually, by composing an account of what appears to be going on within the ceaseless dynamics; via this accounting you must take note of *whatever appear to you to be the system’s cardinal qualities*, as they are discernible from the vantage point in space and time that you presently occupy; and paradoxically, while you are capturing these details, you must also acknowledge that the situation has always altered already and cannot be exactly repeated and therefore requires continuous fresh accounting. Tellingly, one of Cillier’s most influential articles is titled, ‘Why we cannot know complex things completely’ (2002). Next, you also must attend to a profusion of other accounts that are simultaneously being transmitted from other agents elsewhere inside the complex system; you have to hear how the system seems to be tending as perceived from all these other specific vantage points. (This is where the phalanx of outward-looking interdisciplinary experts – nodes in a network – is crucial to the comprehension of complexity. This is where it becomes evident that we need a society of expansively communicative experts, not a preponderance of segregated specialists.) Then, at a ‘meta-level’, you must *make a mesh of all these stories* and accept that, with this mesh, you have not captured the situation; rather, you have just filtered it and collected a residue of some of the ‘telling’ factors and tendencies. You cannot freeze and model the situation, for a

frozen situation is no longer complex; but you can generate a polyvalent account of how the system has been tending. The counsel that is comprised of story-performance and story-witnessing thus offers the best of the definitively insufficient methods we have for understanding how a complex situation effloresces and how intervening agents can act wisely within it (Cilliers 1998, pp. 130–35).

## Curious, Imaginative

David Epstein's recent book *RANGE: why generalists triumph in a specialized world* (2019) covers similar issues. The gist of the argument (and a nub of mine) is captured throughout the ninth chapter of the book, in which Epstein ruminates on a celebrated essay from 2009 by the theoretical physicist and mathematician Freeman Dyson. In an account of the contemporary culture of academic science, Dyson declared that the enterprise of science needs to be staffed by two radically different types of investigators: 'focused frogs' and 'high-flying birds'. The frogs are the types of scientists – deep and isolated – who burrow into a topic that is characterised by so much detail that the scientists never raise their eyes to look out at the horizon. Frogs solve problems serially, one at a time. Dyson tagged himself a frog. Contrarily, the birds survey broad vistas and perceive problems as non-linear patterns that stretch out beyond the perceptible horizon. Frogs are static, pinpointed and *nodal*. Birds launch out from standpoints, connecting *networks* across nodes, carrying and combining information from pinpoint to pinpoint, using their activity and mobility to mesh, in non-linear ways, their own expansive or lateral thinking into the deep insights that have been delineated inside the work of each nodal frog.

As Dyson complains, as Epstein bemoans (and as Millgram historicises in *The Great Endarkenment*), there is an overwhelming tendency in contemporary education to train intensive frogs rather than extensive birds. The birds (such as Bateson) are disappearing. And therefore, the extensive metaphorical ecology of global knowledge is close to collapsing into sinkholes of intensified specialist incoherence (as are the planet's literal ecologies which are becoming harder to know holistically amidst the isolated biological monocultures that litter the global environment).

The first step in solving the problem is, birdlike, to see that there is a problem. The next steps will activate a cosmopolitan kind of 'ethic' which will reshape education so that we are emboldened to train and reward scholars for venture in their ideas as well as for the defensibility of their assertions. In other words, the university domains and the employment domains will need to temper the currently preponderant 'specialty culture' so that education is world-making and imaginative, at least much as it is critical, deconstructive and niche-assertive in a 'policing' or fault-finding manner. We will need a little less of the practices of *critique* so that more projective *envisioning* becomes feasible without ever abandoning the need for evidence to substantiate declamations.



The programmatic details of such a re-fashioning of knowledge-culture are for another chapter. Indeed, many chapters in this book apply themselves to some of the opportunities. But first we must see how much we need the intellect birds as the extinction events loom around us.

## Conclusion

To recap: at its core the PhD is an avid, experimental pursuit of wisdom. These qualities – wisdom-questing – have been in the PhD's underlying structure for centuries. Wisdom is a particular kind of knowledge, a comprehensive grasp of the systematic influences that play out in engulfing circumstances. Wisdom is an especially thick yet supple mode of understanding. It develops as the result of long experience in receiving and adopting viewpoints that have been transmitted from all across the lived experience that is under examination. The wise person has received and composed (and oftentimes imagined) a plethora of accounts of experience, a plethora delivered from a myriad different points in space and time within the system that is being examined. Thus, a wise person is someone who has been enmeshed in many concomitant (and often contentious) modes of knowing, such that the wise person can develop a holistic system-sense of how the dynamic, unpredictable circumstances might be tending.

Most importantly, to use the vernacular, a wise person 'has seen it all' (or heard it all in counsel) and is therefore not confined to a specialised enclave of constrained capability. A wise person can adopt a profusion of viewpoints in space and time and can envisage myriad lines of feasible actions through a story-world of plausibilities-and-possibilities, a story-world that intimately shadows the actual world. More than just being mercurial in the space and time of the system, the expansive expert can even accept an array of contending, ideological or discursive 'takes' on the system. Thus, a wise person, much like the well-counselled PhD, can cover every standpoint in the field and can thereby develop the ability to propose options-for-action that (even when they are unprecedented) are likely to be valid and defensible for that field. Drawing on enriched understanding founded in wisdom, the expert/doctor conjures new knowledge within the field.

Crucially too, wisdom also promotes imagination, encouraging the experienced analyst to model possibilities of what is not yet known or what might make fresh sense in a new and evolving situation. For as narrative cognition experts such as Benjamin Libet have shown, the prospective outlook that an imaginative seer can offer via a plausible fiction is always launched from the retrospective bank of experience that is stored as images and narratives in memory (see Libet 2004).

To conclude by bringing attention back to the PhD more pointedly, let me observe that a wise person is usually an old person, but not necessarily. Some regimes are designed to accelerate the acquisition of wisdom by younger people. Benjamin tells how the counselling regime in pre-modern artisan training was an expeditor of wisdom. The PhD program can be such a regime too, in the way it can require the



PhD candidate to try to cover, *comprehensively*, every point of view and line of discourse that firstly addresses the topic under investigation and that secondly traverses the field in which the topic resides. In being so comprehensive, the candidate draws into themselves a profusion of perspectives and lines of disquisition that slowly, experientially mesh together to grasp the topic and to install *inside the investigator* an ever-thickening experience of developing that grasp. Implicitly, the candidate feels understanding grow inside them and then the writing of the thesis explicates that understanding in the form of communicable knowledge. In the best of circumstances, the candidate extracts new knowledge from deepened understanding so that they can put it *out there*, in that contested space where doctoral ratification occurs, and the expansion of research fields is overseen by an extensive network of nodal experts. Finally, because wisdom can foster imaginative acuity too, the PhD candidature can be more than the reductive process of training analysts and critics; the candidature can embolden prospective vision-forming too, provided the training gives the expert some palpable, feedback-affirmed experience in how to be efficaciously extensive and connective rather than mostly intensive and specialist.

Imagine not only a research culture comprised equably of some scholars who are ‘frogs’ and some who are ‘birds’ but also a large cohort of researchers, focussing in and flying out, who have been trained to become simultaneously both.

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