Anthropocenes
HUMAN, INHUMAN, POSTHUMAN

Gilson, C. C. (2022). Observing Amid the Anthropocene: An *Excursus* in Methodology or the *How* of Inquiry. *Anthropocenes – Human, Inhuman, Posthuman*, 3(1): 4. DOI: https://doi.org/10.16997/ahip.1045

RESEARCH

Observing Amid the Anthropocene: An *Excursus* in Methodology or the *How* of Inquiry

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Amid complex issues like those of the Anthropocene, choice of methodology in inquiry is critical to assure the validity of an inquiry's conclusions. Confidence in its success can be gained initially through the exercise of introspection. More importantly, the complexity of inquiry needs to be commensurate with that of the subject. Since ανθρωπός (*anthropos*) is the cause of environmental deterioration, inquiry must be thematically anthropological and future-orientated towards the evolution of mankind amid technological advance. These themes promulgate modes of observation from which an inquirer can observe empirically. Eventually, with the need for increasing complexity of inquiry, the abilities of such a method of study become exhausted, with epistemology and empiricism consequent casualties. In a leap of theory and inspired by Haraway's conjecture of the cyborg in posthumanism, the approach then privileges the ontological so that observers instead *become* beings and exploration of the relationship to the Anthropocene of the human *qua* human, *qua* transhuman and so on, can be pursued by moving inside. With the inherent sacrifice of the observing outside(r), the inquirer is deprived of communication. *Academe* then substitutes as the cerebral, transcendent, inquirer/communicator and survivor of posthumanism amongst beings, *sans pareil*, through publication and education. Some consequences of this are explored. The author borrows gratefully from Niklas Luhmann's characterisation of observation in social systems. His assertions concur with the effects of the transformations proposed in the study, including the autopoiesis of the newly-theorised beings.

Keywords: Modes of *observing*; environment; systems theory; transformations; inside/outside; modes of *being*; communication; *academe*

Appreciating methodology

All inquiries into the world are grounded in observation.[1] Methodology dispenses a theory-laden active, rigorous approach to observing.[2] At the least it represents a structured approach to observing and describing but amounts to much more than that.[3] It is the systematic, theoretical analysis of the methods applied to an inquiry;[4] therefore it is itself already a philosophy of observing, describing and communicating.[5] Methodology is a branch of knowledge that deals with the general principles or axioms of the generation of new knowledge (McGregor and Murnane, 2010). For the purposes of this study it is grounded in observation. Methodology offers a theoretical underpinning for understanding the observations in a given inquiry (Jackson, 2013); in its absence, it cannot be ascertained whether the conclusions of an inquiry are valid (Mkhomazi and Iyamu, 2013) comment that, 'it is the analysis of the principles of methods, rules, and postulates employed by a discipline.'[6] It is not simply a question of whether to use focus groups, ethnographic studies, interviews, surveys and so on in an inquiry. They are merely its tools. Broadly, it is the application of theories of inquiry commensurate with the complexity of the subject and facilitating validation of its conclusions. Radically, it might involve re-characterization of the subject or transformation of the inquirer. Themes like this are amplified by Christine Ramazanoğlu with Janet Holland (2002) in their book *Feminist Methodology: Challenges and Choices*, in which they enumerate decisions that must be taken in choosing methodology with regard to research into feminist discourse. While the text is specialised, nevertheless it illustrates that such decisions are common to social inquiry. The authors also comment on tensions between various schools of thought over the appropriateness of different methodologies.

The enterprise of inquiry intrinsically is epistemological. Stemming originally from Enlightenment-inspired quests for independent thought, it asks *how* knowledge is accrued. It foregrounds methodology. Inquiry also is, by default, empirical, in that it relates to experience gained through observing.

A study of methodology like this is akin to regarding objects lying along hypothetical multiply folded surfaces. Andreas Philippopoulos-Mihalopoulos (2017) uses

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the metaphor of surfaces helpfully in visualising the environment and it is freely adapted here. In the instant case, a first unfolding of the folded surface exposes the diversity of epistemological approaches to inquiry amid the complexity of the subject. A second unfolding reveals inquiry into *theories* of inquiring in relation to the subject and can suggest those that are novel or likely to reveal fresh understandings.

A scholar new to the field of inquiry and keen to begin would benefit substantially from Arvind Kumar's *Research Methodology in Social Science* (2002), in which he explains ably the fundamental methodology in this area of study. Research in social science is privileged in the present work over that of natural science because, although anthropocenic effects can be observed in terms of physical changes to the world, it is human intervention that is paramount. *How* that can be studied is a question for the social sciences.

Part I

Observation and the ineffable virtues of methodology in inquiry

In exploring the methodology of inquiry, this study champions observation as the critical *modus* of approach. It is also essential to affirm *how* thorough contemplation of methodology contributes to valid outcomes and dependable estimates of truth. Its virtues are upheld in the following characteristics, given as short assertions.

Theory and methodology – Inseparable but discrete travellers

The following excerpts are borrowed from the acknowledged wisdom of Andreas Philippopoulos-Mihalopoulos (2017) in seeking ways of returning to environmental law as the mentor of order amid the confusion that reigns in the Anthropocene. The distinctions made clarify the present discourse.

In the present context,

> 'The theoretical perspective [...] refers to the way thinking changes or at least is affected by the Anthropocene—indeed *how* current thinking is turning in order to accommodate the needs of the new epoch.' And, concomitantly, '[...] methodology refers to the way the Anthropocene changes the way we seek knowledge and involves epistemological presuppositions about the limits of such knowledge' (ibid, 118).

Methodology defines the way knowledge is obtained (epistemologically) in order to formulate theory. If a theory has already been held out, then methodology will determine the means by which it can be validated.

The nature of observing and learning: Epistemology and empiricism

Several elemental and progressive foundations of knowledge acquisition in inquiry are essential for achieving understanding. They are estimated by the author to be as in the following assertions.

Nothing can be learned or understood except through the human faculty of observing. Observing perceives the world and leads to the naming of things. The history of observing constitutes experience. Experience leads to understanding of new things and improves observing. It pertains to epistemological inquiry and empirical method. Not only does it elicit knowledge but also commensurate methodology organises *how* knowledge is created. Without communication, observing is opaque. Description communicates an epistemological account of empirical inquiry.

The contribution of this study to appreciation of methodology

This section summarises the direction of the excursus and what it will reveal to benefit the scholar. It will foreground examination of the methodological approach to inquiry amid the Anthropocene, not the object *per se*.

Amidst a plethora of information and comment in the social sphere, inquiry will be barren unless founded on apposite methodology. Not only does the basis of that require adequate explication but also *how* it will assist understanding in a specific manner. The section therefore offers justification of the studied methodology amid the peculiarity of the Anthropocene and provides the reader with an overview of how the piece is structured. The study of methodology therefore needs to declare its own methodology in a two-layered approach. Also, reference to guiding theory will be made as it inheres importantly in the chosen methodological approach.

The keyword in this endeavour is '*how*'. Methodology concerns, *inter alia*, the *how* of discovery. It is the means by which truth is attestable.[7]

Human, inhuman, transhuman and posthuman reproduce the criteria for inquiry amid the Anthropocene and their self-description contextualises their experiences in the world. They categorise the manner in which humanity has impinged on the environment. Since the outcome of inquiry is empty without affirmation of commensurate methodology, to succeed, the narrative must attend to possibilities for enablement of truth-finding, that can lead, ultimately, to an estimation of what those truths are.

The supremacy of the observer; remediating the limits of observing

In this methodological endeavour, the observer is positioned at the head of and integral to means of inquiry. The facility of observing the observer's observations constitutes a methodological framework or strategy for inquiry but the *mode* of observing and communicating outcomes speaks of more. Observing according to the aforementioned four modes or traditions takes place as if the observer were a disinterested outsider donning them as apparels and using them to condition their observing. Importantly, this conditioning elicits the kernel of Anthropocenic description as, together, they account for human and human-technological influence on the era.

However, limits of this kind of observing quickly are reached, as the writing will disclose, and the utility of

these guises dissembles. Embedded empirical inquiry, for example, soon becomes a mundane exercise of overwriting previous information, so progress stymies. The complex nature of the Anthropocene demands corresponding complexity and appropriateness in observation. This narrative is tasked with its description. Ultimately, the passivity of observing the scene from outside will be replaced by the active credo of living within it.

Human acuity, the gamut of resources for inquiry; means and routes to understanding

The following are the author's pragmatic impressions of the elements of inquiry in current context. Humans perceive nature via their senses but sensing and sensations require organisation propelled by intention. Organised, intentional perception is observing; repeated observing accumulates experience and memory. Empiricism denotes material collected from observing that builds experience. Theory of inquiry asserts that all knowledge originates in experience.[8] Subjectivity in observing and concluding implies understanding mediated by the psyche or disposition of the observer. Communication conveys truths elicited by inquiry, which in turn must be understood by a recipient for their legitimation. Whereas empirical observing accumulates the material of truths, epistemology rests on the methodological basis of *how* such truths are made apparent. These elements are all bedfellows in a very crowded bed.

Orders of observation in inquiry and the how of observing

First order observing of the world is of events. Observation of *how* that observing is observed constitutes second order observing that can be used to critique first order methodology, in other words of *how* first order observers observe. First order observers in the social sciences cannot observe themselves observing, hence are blinded to it, but second order observers can evaluate first order observers' methodology, that is, *how* their observing was done. In the natural sciences, second order observers observe *how* the natural world was observed. Scientists are similarly disabled with regard to first order observing because they would need to step outside their operations in order to consider *how* they observe science.[9]

Successive higher observing orders are possible whenever observers observe *how* lower order observers observe. As a living example, it is possible to review the *fitness for purpose* of a non-governmental organisation (NGO) that already is observing in its dedicated field. The case of the World Trade Organisation is taken amid criticism (Rorden, 2014). In an hierarchy of orders of observing there is a question of observing *how* each successive order observes. This capacity is common to regulators of enterprises, for instance the House of Lords in the bicameral legislature of the United Kingdom regulates the activity of the House of Commons by amending the bills it submits. It constitutes second order observing of the observing of the Commons. The first order observing of the Commons is of the utility and provisions of a bill through debate. The House of Lords becomes an effective second order observer.

Thematised Luhmannian systems as accompaniment to the methodological journey

Resonances with Luhmannian systems theory (Luhmann, 2013)[10] occur consciously throughout the exposition. The study was inspired by his theory of observing and, indeed, becomes the central theme of inquiry. Later, a one-to-one correspondence will be recognised between observing in the Anthropocene and Luhmann's captivation with observing in his theory of systems.

The empirical/epistemological destiny

If empirical inquiry sponsors epistemology, then observation is its mode and observing its resource, energy and means. Description then constitutes the materialisation of knowledge and dissemination its means of communicating. Communication potentiates mutual understanding among communicants. Observers of such communications become higher order observers in turn and likewise can communicate their understanding to others. Without communication, knowledge can be neither transmitted nor appreciated—double contingency in Luhmann's characterisation (Vanderstraeten 2002).

Commonplace second order observing

The *Student Satisfaction Survey* in British universities is an inquiry into student perception of teaching, not only to assess their satisfaction but also for the institution to identify opportunities for improvement. Student responses constitute first order observation and the university perception of *how* they observed are observations of second order.[11] Prospective students looking for a suitable university place utilize this communication as third order observers. The enterprise belongs to the realm of performance and quality control that is routinized in public institutions and is a prime example of useful observing.

Examiners of university doctoral theses are second order observers of *how* the candidate observed during the study, who can challenge the suitability or success of the student's chosen methodology in the *viva voce*. Flawed choice could result in rejection or referral. It would be impossible to detect whether the thesis had observed according to the aims of its inquiry (and its devolved research questions) without application of sound methodology. Similarly, referees of articles submitted to academic journals are second order observers of authors' methodologies in that their concern is for convincing validation of their proffered hypotheses. Rejection might be consequent if deficient.

The *Research Excellence Framework* assessment undertaken periodically in British universities is carried out by research funding bodies to secure '[…] the continuation of a world-class, dynamic and responsive research base across the full academic spectrum within UK higher education (REF, 2021). It is conducted by a 'process of expert review' of publications selected by submitting institutions to be among their best work. 'For each submission, three distinct elements are assessed: the quality of *communications* […], their *impact* beyond academia, and the *environment* that supports research.'

(See, for example, Manchester Metropolitan University REF2021). Assessors in expert panels therefore undertake second order observing of submission of communications[12] by authors according to these criteria. It characterises and positions observers so that they can observe only in light of these elements. Intrinsically, it creates a formal scheme for observing that comprises its own special methodology.

In medical epidemiological studies, methodology should be such as will eliminate, *inter alia*, bias in selecting sample groups (target populations among whom observing is to be done). Statistical methods for analysis of observed data must be appropriate to render the conclusion valid.[13] Inherent in Trisha Greenhalgh's (1997) suggestions are that epidemiologists communicate these via *academe* as first order observations in publications and lectures.[14] Second order observers (the 'audience') observe and communicate *how* authors achieved it in critique. Higher observational orders can observe and discuss the significance of those conclusions.

Some misguided methodologies

Methodology sometimes is misguided or, rather, practitioners are misguided in *how* they engage with it. The medical scientists who postulated that the onset of autism in children was associated with their having received the Measles, Mumps and Rubella (MMR) vaccination used flawed methodology in reaching their conclusion, leading to a false positive outcome (Wakefield, *et al*, 1998). The scientific community disapproved and rejected it by means of second order observing of the author's communications.[15,16]

In the English legal jurisdiction, errant medical expert opinion witnesses misled courts into making egregious errors of judgment and elicited unsafe convictions over allegations of Non-accidental Head Injury (NAHI)[17] of children.[18,19] The unreliability of evidence admitted into court of such witnesses was detected in an exquisite example of perspicacious second order observation—in this case observing that *how* an expert observed was outside his sphere of competence.[20]

In sociological study, methodology appropriate for a prospective inquiry means choosing *how* to garner information so that it can be known what it indicates, whether by focus groups, questionnaires, structured interviews, ethnographic study and the like, including the question of whether triangulation of methods is necessary (Kumar, R., 2019). Wrong or poor choice could mean the observations under- or misinform. Hammersley and Gomm (1997) discuss the effect of bias in social research, which is only one of several distortions in results that can occur and can be serious.

Observing as nascent methodology. The how of observing. Epitomising observers

How observing is conducted is theoretically grounded. Second order observing takes into account the methodology of the first order and this in turn needs its own methodology, also theoretically grounded.

To remove bias and randomness, it is essential to epitomise observers so that their way of comprehending communications can be known, their situation in the world acknowledged as well as *how* they observe. This would complete the 'provenance' of the inquirer. It is important to identify their relationship to the inquiry too: for instance, a lawyer will observe events from a legal viewpoint, a scientist according to scientific canons and so on. Amid the academic ethos of interdisciplinarity, though, observers might wish to observe *how* other social systems observe. But they should do this neither by disassembling the normativity of their own observing systems nor the 'illicit' de-differentiation of observed systems.[21] For instance, in a criminal prosecution, an adjudicator from the social system of law, observing *how* the social system of science observes, must conclude on and communicate a legal comprehension of science when it is proffered in evidence by expert opinion witnesses. Judges also must decide on the evidence to prefer if a conflict between experts occurs. All this is tantamount to secondary observation and relies in part on evidential admissibility standards derived from the philosophy of science.[22]

Anthropocene unseats Holocene: radical transformations in the panoply of the observed subject

Depicted as creating a new geological era, according to Crutzen (2006), observations of the world during the Holocene[23] would have reconciled nature as supreme, with humans subservient (Davies 2020). From the industrial revolution, though, humans began to impinge on the world significantly and often negatively, to the extent that now some human influences are difficult to forfend and others might be irreversible. The deleterious effect on the world insidiously could change its constitution, eliminate species and even render it hostile to life.[24] From an anthropological perspective, humans are now so successful as a species that they have overpopulated the world and not only harmed it by their negligent lifestyle but also depleted its resources and degraded the environment.[25] Figuratively, it is as though humans collectively have created a Frankenstein's Monster and can neither contain its excesses nor remediate its consequent harms.

Conceivably though, the Anthropocene was recognised by *differencing* from the Holocene and the Holocene itself, as having ended, only acknowledged *ex post facto* by realisation of the Anthropocene.[26] Amid the Holocene, humans lived in a non-disruptive balance with the environment, that is to say they could observe it, live within it but did not disturb it.[27] Any environmental changes were part of the natural evolution of the earth. This harmonious period was marked by little entropy in the state of the world and a paucity of dynamism in its relationship with humans. By present standards of urgent inquiry and as a description of a ten-thousand-year epoch of geological time,[28] it would have been thought unremarkable. Empirical study (that which would then have been possible) would have sufficed to describe it. A seminal moment occurred when Holocenic harmony was superseded by Anthropocenic dissonance.

The difference of the differencing is in the observable negative effects that humans can exert. Though natural forces still deploy and humans are powerless to mitigate them all, in the Anthropocene it is now human influence that occasions many effects, from climate change to extinction of species. The world is now chaotic;[29] there is marked disorder within observable systems and the relationship of humans to their environment has become highly dynamic. While physical sciences can observe changes quantitatively, it will be seen later that it is the *relationship* between humans and environment that will emerge as crucial.

Part II

The need for innovative paradigms

In Louis Kotzé's edited volume *Environmental Law and Governance for the Anthropocene*, Andreas Philippopoulos-Mihalopoulos (ibid: 118) contends that three revisions of perspective should be adopted through which better cognisance of the nature of the Anthropocene could be gained. First is an argument for a new, Anthropocenic vocabulary appropriate to the social sciences and humanities. The second is for revised theoretical perspectives that accommodate current thinking in the new epoch. Third is a commendation for the search for new methodologies that change the way knowledge is sought amid the Anthropocene. Those contentions are affirmed in this essay and the discourse will develop with them as themes.[30]

Limits of the empirical-epistemological enterprise

Empirical observation measures the change and pace of change of negative anthropological effects. Objective measurement of changes in the world according to science is important for appreciation. Regarding matters revealed empirically, practical but fraught questions arise such as, how quickly and sufficiently can carbon dioxide-absorbing trees be planted to replace those lost to industrial scale deforestation? or how long will it take for increasing renewable energy supplies eventually to substitute completely for carbon-based generation? (For deeper exploration of such issue, see Cowell, 1997). These are great tasks and revelation of stupefying truths with alarming consequences only increases strain on researchers. Although empirical-epistemological observation always will constitute a foundational methodology of inquiry, it is imagined that it would continue in the same passive manner indefinitely as the thermometer of change, unless riding on the back of more insightful strategies in relation to the complexity of the problem. As presently perceived, it does not achieve adequate complexity in describing the Anthropocene and the relationship of humanity to it. Reasons for this will be revealed soon.

Kuhnian departures?

It is fashionable to call significant paradigm shifts in theory 'Kuhnian', and it should be considered whether what is to follow here conforms. Thomas Kuhn's prescription concerns the cumulative formation of scientific discoveries unless or until antimonies appear. Conventional theory then ruptures and a new basis for it is sought (Kuhn 1962/1970). In the present work, the initial theory of observation holds that it has a complexity inadequate for that of the studied field. Relating principally to the methodology of inquiry and only secondarily to discovery, it is no less redolent of Kuhn's perception. The similarity here is acknowledged, together with the desirable consequent enhancement of methodology that will reveal new outlooks and understanding. For present purposes, and with licence, this substitutive paradigm could at least be termed 'para-Kuhnian'.

Adequate complexity *contra* reduction of complexity

The Anthropocene as phenomenon[31] is highly complex.[32] It is more so when progressing from truths in the epistemological enterprise to observing the way humans behave in relation to the world and other dimensions that they introduce. It is essential that the methodology of inquiry be correspondingly adequately complex as to observe at the same level as the complex phenomenological scene.[33]

Zelli and Pattberg (2016) have been relied on here for assembling descriptions of anthropological complexity in their edited work. They look, *inter alia*, at different forms of intricacy and diversity – material, ethical, institutional, spatial – and the relations between them. They report that all authors in the assembled work agree there are several types of growing complexity in the Anthropocene that cannot themselves be reduced. Described is the natural complexity of the planet's ecology, the psycho-social complexity of humans and their institutions and the political or moral complexity of bringing them together meaningfully.

The debate continues in this most informative work and the following reports it. Regarding the use of network analysis as a tool for visualizing or even untangling complex relations between global governance institutions,[34] an author claims that the very concept of the Anthropocene deprives us of this possibility as it is too simplistic and does not do justice to the normative complexity of our environmental situation. Others regard the Anthropocene as a flexible concept, helping to make sense of the immense complexity of the physical and cultural worlds, including the limited human understanding of them. Contributors also differed in their approval of institutional complexity. Some welcomed a diversity of institutions and instruments from an ontological stance, inasmuch as it reflected ethical and legal pluralism and the need for flexible responses in the Anthropocene. Others cautioned that this diversity needs to be grounded in overarching principles like human dignity or ideas of the good society and the good environment.

The preceding digest from the cited work illustrates the complexity of the complexity[35] of observing the Anthropocene as a folded concept. Though Zelli and Pattberg write in the area of politics, governance and institutions, it is just one of many of the diverse platforms from which observing can be undertaken. Also clearly intimated is the need for adequate complexity in framing observing.

Complexity revealed like this demonstrates how many themes there must be connected with the Anthropocene. While the plurality of extant observational platforms connotes a complexity of its own, it is more an issue that it requires so many to achieve even the most imperfect account. Therefore, prioritising a specific observational stance endorsed by plainly intended methodology that is adequately complex, at the same time 'levels up' an inquiry in relation to the subject and at the same time can reduce it because then only an element of the complexity need be studied at one time. Therefore, complexity will be both accommodated and managed.

Introspected methodology: Folding, reflexivity, reordering

So huge is complexity that it can be perceived as a 'problem of a problem'. Such duality means that the occurrence of the problem is itself problematized, which can be modelled hypothetically as a folding of one problem within another in a folded entity. Continuing the metaphor, if multiply folded surfaces were to represent modern society, the first unfolding would reveal the anthropocenic degradation of the environment and all its attendant concerns, observed and communicated through second order observation. A further unfolding would expose the existential problem of the Anthropocene for society.

Multiple folding in methodological strategy can be imagined too. Introspection in a scheme would empower self-audit and potentiate reordering of the manner of observing.[36] That would replicate a first unfolding. More searchingly, reflexivity would be embodied in a further unfolding that would incorporate theories of inquiry into the inquiry. It should reorder its design so that the methodology is uniquely shaped to educe the material sought and validated according to the theoretical underpinning of a particular approach.

Inquiries lacking introspection and reflexivity could flounder through overconfidence, inadequacy or wrong direction. Communication of observation would then under- or mis-inform. True, yet mundane. But absent reflexivity in the design of an inquiry, there would be no recourse to apposite theory, so examination would not be in its light. From these instructions it should be apparent that inquiries always should introspect, be reflexive and contemplate reordering so as to communicate the best version of the truth that the chosen methodology can provide.

The anthropological stance

It has already been commented that there are limits to empirical observing of the Anthropocene, though it still is possible and useful,[37] but a perspective is needed that engages with the human contribution to the *self-consuming* aspects of humanity, like that described by Clark (2012a).

Initially, an impression could have been created here that the Anthropocene exists in a bubble and that means must be secured of looking inside it, as if with some kind of penetrating spyglass. While seemingly true, such an approach would be denigrated as futile without characterising or contextualising the observer.

That the Anthropocene is directly attributable to human agency is not controversial. *Ergo*, it insists that inquiries are needed into the anthropological nature of humanity that drives it towards, in Clare Colebrook's (2013) view, *self-extinction*. Inquiry can be segregated into human, inhuman, transhuman and posthuman anthropological modes or traditions. Utilised, they both categorise and direct observation. They augment the methodologies of inquiry in that they provide standpoints for observation and identify the mission of observers. They do not constitute methodologies themselves but provide a background against which human agency and the reflexes of the Anthropocene can be perspectivised and contextualised.[38] Importantly, too, they deconstruct it so as to reduce complexity. For ease of description and to avoid irritating repetition in the ensuing text, these anthropological perspectives will be alluded to as distinctive modes of observation, or just 'modes'.

While commenting on these approaches in observational methodology, it will be helpful concomitantly to illustrate some real-life occurrences from the present day and from history that can be or have been observed under each category.

a. Observing via the human mode

Changes in understanding the world amid elevation from Holocene to Anthropocene are located in humans. Responsibility for the *Κάινος*[39] is entirely human. While humans are the only species able to inquire into and account for negative influences in the world, they are also uniquely their progenitors. As Steffen, Grinevald, Crutzen and McNeill (2011) proclaim:

> 'Climate change has brought into sharp focus the capability of contemporary human civilization to influence the environment at the scale of the Earth as a single, evolving planetary system. […]'
> 'Taken together, these trends are strong evidence that humankind, our own species, has become so large and active that it now rivals some of the great forces of Nature in its impact on the functioning of the Earth system.'

These unequivocal statements of ineluctable truth from the seminal work of these scholars position the human firmly within an accusational frame.

Inventories of environmental and the many other changes in the Anthropocene can be sourced elsewhere,[40] negating the need for their repetition here. However, they do constitute second order communication of first order observations of effects as epistemic and empirical inquiries eliciting originary truth.

Wright and Nyberg (2015) examine *Climate Change, Capitalism, and Corporations: Processes of Creative Self-Destruction* in a work of this title, which is written largely from the viewpoint of the economy. Reviewing it, David Ritter (2015), the Chief Executive Officer at Greenpeace, Australia Pacific, usefully advises that Wright and Nyberg (2015) boldly explain,

> 'the role of big business in global warming. By going inside the minds and boardrooms of big corporations, the authors give us extraordinary insight into not only how businesses think about climate change, but also the creative self-destruction they are unleashing.' https://climatepeopleorg.com/2015/09/25/new-book-on-climate-change-capitalism-and-corporations/.

This gives a different (second order) insight from the insistent concern for greenhouse gases, pollution and climate change, one that is equally pernicious and represents another example of human-derived despoiling.

Climate change denial

It might imply methodological impoverishment in the present study to omit deniers of climate change. However, dalliance with the idea need not be protracted. Dunlap and McCright (2011) attribute this human action to conservative politics, economics, defence of carbon energy and manufacturing industries and the deliberate undermining of climate science (ibid, 144–160). In spite of it, these could be equally *amenable to observation*,[41] as methodology is indifferent to its subject matter.

Humans can observe the effects of their interventions in the environment and quantify them objectively through first order observation. Secondary observation initially must involve critique of first order techniques and the assumptions that observers attach to results. It should introduce thoughtfulness about those interventions and their consequences. A third observational order could propagate recommendations for human behavioural change so as to ameliorate adverse environmental effects as a future-oriented and intellectual exercise.

b.1 Observing via the inhuman mode

The term is perceived here as problematic,[42] not only semantically but also because an early writer (whose name shall be revealed soon) signalled confusion over its character that still is relevant. The present author will cite instances where it can be shown that 'inhuman' behaviour *by humans against others*[43] has contributed to deleterious effects in the Anthropocene. It is the meaning that will be assumed here, even though it might controvert orthodox understanding.

For the sake of methodology that will withstand criticism, the term and its appreciation should be unambiguous, otherwise indication of the mode would become questionable. In the present study, the four nominated modes are discussed sequentially, as if in a list and each as if discrete, but they are not necessarily all so expressly indicated.

In the literature of the Anthropocene, 'inhuman' in current context sometimes is read (awkwardly) as 'non-human', that is, as pertaining to materiality. For Nigel Clark, (2012b) though, the Anthropocene presents a timely reminder of its 'inhuman nature'—systems and events beyond human control with which living species have always had to contend (ibid, xiv). Castree (2014), maintains that this (the inhuman) is nature that modern Westerners largely have screened out through geological good fortune and technology. Tobias Gumbert (2019), reviews the plurality of understandings of materiality and non-human agency vis-à-vis the human.

b.2 Inhuman again: Unexpected associations

The inhuman also can describe amoral treatment of humans by fellow humans, as in genocide, terrorism or slavery, and this impacts the Anthropocene in ways not readily imagined. Prominent is the estimation of Lewis and Maslin (2015) that the effect of European infiltration of America between 1492 and 1650 drastically reduced its indigenous population via exposure to (foreign) diseases, war, enslavement and famine. Dana Luciano (2015) comments that these two authors were the first to recognise genocide as part of the cause of epochal division. Although the emphasis in Lewis's and Maslin's text is on the environmental effects of population reduction, the message taken from it here is the inhuman treatment that caused it.

Another example lies in the forced partition of India when the colonial government ceded it independence. According to Brass (2003) authorities, both national and colonial, knew, accepted and even preferred, that religious disputes be settled, inhumanly, by violence. Frances Stewart (2002) indicates that war ravages the physical and political environment; those gaining least from the conflict are unprotected from it.'

There was inhuman disregard for the *Gaeltacht* in Ireland during an historical period of great reliance on agrarian economy. They were relegated onto infertile agricultural land by unscrupulous landlords, culminating in the great potato famine of 1845 – 1849 (Braa, 1997). It meant that the environment became hostile through food poverty. As a sequel to this, from the late nineteenth century potato production in Ireland has moved towards today's highly mechanised, specialised, intensive and market-oriented agri-industrial food systems. The new high input–high output system has been accompanied by an expansion of environmental impacts extending from local to global scales (D'Arcy, 2010). In this transition can be seen movement from the persecution of humans to human persecution of the environment.

Aaron Hanlon's comments (2016) on the productions of the Restoration-era epistemologist philosopher, Lady Margaret Cavendish (1623 – 1673) (identity revealed at last and thank you for waiting) takes seriously her perception of the distinction human/inhuman as blurred. Hanlon comments that Cavendish saw,

> '…this notion of holding dominion over nature through experimental knowledge not only as a form of arrogance, but also as kind of misprision, a failure to recognize that human observations of nature are always mediated by the mysteries of nature itself, among which are human observers and the problem of objective observation' (ibid, 59).

This suggests, not unreasonably, the conflation of observing and humans as observers. Hanlon also recounts

that Cavendish opposed 'experimental philosophy'—a form of inquiry undertaken at the time taken to have epistemic priority over substantive claims and theories (ibid, 59).[44] As Anstey and Vanzo (2016) amplify, exponents of this form of inquiry 'held that we should firmly commit themselves only to those substantive claims and theories confirmed by observations and experiments'.

Resonating with modern scientific inquiry, contemporaneously it ruled out the speculative and 'armchair' philosophical thought that then prevailed. Nowadays, we would applaud that. Not for Margaret Cavendish though. Hanlon (ibid) echoed Timothy Clark's notion, of his human/inhuman distinction —or the blurring of that distinction—as a central characteristic of the Anthropocene: the idea that humans cannot simply extract themselves from nature so as to rise above it, nor can they understand nature entirely as other, as separate from humanity and human effects (Clark, 2013; Hanlon 2016, 59). Inevitably, as Cavendish asserted, observations are related and filtered through lived, human experience (ibid, Hanlon 2016, 55).

Unfortunately for modern delectation of Cavendish's writing, she anthropomorphised nature, treating it as if animate and intelligent (ibid, Hanlon, 54) so that she was able to offer her own model for exploring the status of relations between the human and the inhuman in the discourse of the Anthropocene. Before dismissing this as completely fanciful, first it is universally true that separating the nature of humans from their observations is difficult.[45] Secondly, it signifies that such a debate is essential. That aspects of the Anthropocene can seem to display intelligence is not so far-fetched when considering that the entire issue devolves from the interaction of humans with nature, the aspects of it that humans should prioritise for the sake of their continued flourishing and especially *how* nature reciprocates their measures. Without engaging the metaphysical, sometimes it is as if nature is sentient because it is dynamic and can respond to human influences. Else, why should the phenomenon be referred to as the Anthropocene and why should there be surprise at the thought?

In conclusion, it appears that the distinction 'inhuman' renders a dubious basis for observation, since it can have multiple interpretations. It is hoped that a reasonable representation of it has been offered here, even if slanted. It is preferable to allowing the distinctive mode to become a casualty of the discourse and, as has been shown by examples, the 'inhuman', as read here, is not without effects on the material environment. The choice of perspective chosen by an inquirer in situations like this should preface a study.

b.3 Observing amid the inhuman

Through the emphasis imparted to descriptions of the inhuman here, observing would amount to empirical first order reading of social and political history, with cautious regard for Cavendish's idiosyncratic scientific philosophy. Combined with the account of *how* observing through the inhuman mode was done, higher order observing would conclude on the physical (and socio-historical, if chosen) significance of the disclosed events.

c.1 Transhuman

Observing via this distinctive mode conjures a conjectural imaginary where humans and an advanced 'techno-culture'[46] co-exist harmoniously, with humans feeding advantageously off the installed technology. The weight of observing is on human benefit. The transhuman outlook is futuristic and optimistic but so far contingent. Proof is yet to be had that such relationships could form without risk: we would have to wait until technology advances sufficiently as to become completely dependable. Whether to utilise human action or cyber-action in observing would remain an autonomous human choice.

Nick Bostrom (2005) provides an imaginative prospect of the transhuman life in which humans 'exploit technological inventions that improve, lengthen, and [...] possibly change the lives of human kind.' Implied, too, is progress towards our becoming posthuman (ibid, 4). He proposes elevation of the human race to capacities and intellectual prowess through a 'more proactive approach to technology policy.' (ibid, 4). According to him, 'transhumanism promotes an interdisciplinary approach to understanding and evaluating the opportunities for enhancing the human condition and the human organism opened up by the advancement of technology' (ibid, 3). In Francesca Ferrando's words (2013: 27),

> *'Human enhancement*[47] is a notion crucial to the transhumanist reflection; the main keys to access such a goal are identified in science and technology, through the possibilities inscribed within its possible biological and technological evolutions.'

Bostrom also pays attention to present technologies, like genetic engineering and information technology, and anticipated future ones, such as molecular nanotechnology and artificial intelligence (ibid, 3). He considers that transhumanists hope that by responsible use of science, technology and other rational means, humans will eventually become posthuman, that is, beings with vastly greater capacities than at present (ibid, 4). Wisely, he warns that, '[...] society should be organized so that explorations can be undertaken without causing unacceptable damage to the social fabric and without imposing unacceptable existential risks' (ibid, 9). These are not identified but imagination will provide.

c.2 Observing amid transhumanism

First order observing of the world via this mode would be of the occurrence of events through a dedicated methodology of inquiry based on the nexus of humans and technology in society. Apart from a critique of first order observing, second order observing would be organised to communicate productive correspondence (or otherwise) between aspirations for the successful collaboration of humans and technology on one hand, and reality on the other. It would communicate *how* transhumanism thrives.

d.1 Posthuman

A pessimistic outlook towards this mode of observing could be justified owing to the underlying portent, namely that people could become entirely robotic, with human discretion subverted. The idea concerns shared decision making between humans and technology, with it being uncertain which entity was responsible. In playful vein, the present author considers it could allow humans freedom and time to ponder more complex issues, ironically, such as mitigating the environmental and economic consequences of the Anthropocene![48]

Irony is not lost on Rosi Braidotti (2019, 1) either, when she begins her article on Posthuman Critical Theory with the example of the *CAPTCHA* 'I'm not a robot' authentication checkbox[49] to be ticked before accessing a website, confirming that the applicant is a genuine human inquirer. Singularly, it obviates the control that Artificial Intelligence typically could exert over humans in the execution of tasks, problem solving and decision making. Permitting drama only momentarily, it could be said that, with successful development of the posthuman with devices such as Amazon's *Alexa*, driverless cars and smart motorways, the destiny of the human agent with regard to the Anthropocene would be revolutionised. The matter warrants attention.[50]

The posthuman distinction could be said to have origins in the introduction of domestic labour-saving devices after the Second World War, as an online resource authored by Eleri Kyffin (1994) from the University of Westminster shows. Advances made during that conflict also energised development in modern technologies (Pan, 2016). Later, and speaking polemically of the future, the late theoretical physicist, Steven Hawking, expressed a fear that humans would not be able to evolve as fast as machines: '...they [the machines] would take off on their own and re-design themselves at an ever-increasing rate.' He continued, 'Humans, who are limited by slow biological evolution, couldn't compete, and would be superseded.'[51]

The view is alarming and, with our current state of knowledge, on its face the view becomes a question of whether one is persuaded that humans will retain or lose control amid artificial intelligence. Of the four distinctive modes, the posthuman seems the most evocative of Frankenstein's monster.[52] For this reason, it is important to unpack posthumanism in order to estimate whether it constitutes a threat to future society, and of what kind, or will simply affect what humans will *become*.[53]

Concern might be for the extent to which devices or systems relying on the ubiquitous algorithm cause humans to sacrifice their identity, autonomy, primacy and functionality. In that humans are mediators of observing; any transformation of their nature would affect the methodology of inquiry.

Donna Haraway (2004) takes a radical view that foresees a culture in which the distinctions between machines and humans are elided. In a critique of Haraway's thesis, Braidotti (2006, 200) reports that she (Haraway) asserts that humans would become part of '...a hybrid, or body-machine, the cyborg, or the companion species, ... a connection-making entity; a figure of interrelationality, receptivity and global communication that deliberately blurs categorical [categorial?] distinctions (human/machine; nature/culture; male/female; oedipal/non-oedipal),' This, indeed, would represent a radical ontological transformation of the human. Seemingly fantastic now but recognising the present rate of evolution of machine culture, Haraway's vision might not one day be very far from reality.

The futuristic example of the cyborg is chosen in this essay to illustrate the possible, together with the apogee of human evolution. Elucidated, it contends a clear dependency between technologies and humans, rather than ineffectually trying to estimate how much residual autonomy humans would retain in less extreme projections of posthuman cultures. It helps, too, in (tentatively) affirming the future role of humans, however proscribed, instead of appearing to signal the nemesis of the species. The cyborg example represents an absolute condition. Peter Bloom (2020) visualises an interdependency of human and artificial intelligence which he nominates transhuman but his descriptions more closely imply the posthuman, its nature and consequences.

Haraway's at the same time exciting but foreboding vision is replete with unknowns. It prompts an inquirer to question whether posthumanism allows space for observing and, if so, who would constitute the observer amid this radicalised *Κάινος*. At stake would be the innate capacity of the posthuman to observe and communicate. This would also be a function of the interrelational being if it were able to self-educate about the environment; after all, there is no reason to suppose it (the being) could not learn about it, nor science nor the economy.[54]

Hayles (1999) relates three interwoven stories about *how* we became posthuman, best cited verbatim and enumerated for exact understanding. They are,

> [1] 'how information lost its body, that is, how it came to be conceptualized as an entity separate from the material forms that carry it; [2] the cultural and technological construction of the cyborg; and [3] the dismantling of the liberal humanist "subject" in cybernetic discourse, along with the emergence of the "posthuman.'"

d.2 Disinheriting ανθρωπός (anthropos)

Partly on account of her feminist-inspired objections to the structure of society (in which she concurs wholeheartedly with Haraway) and through a posthuman perspective, Braidotti (2016) would prefer to dispense with the notion of ανθρωπός (*anthropos*) that resides in notions of the human – a separation she describes as 'painful' (ibid, 16). She asserts that, '"human" is not a neutral term but rather a[n] hierarchical one that indexes access to privileges and entitlements, linked to both the humanist tradition and anthropocentric "exceptionalism"' (ibid, 15). She imagines a posthumanist with distinct 'anti-humanist feelings and resolute technophilic leanings' (ibid, 16, 21). Not perturbed at the notion of a displacement of the centrality of the human – both as humanist 'Man' and as *anthropos* (ibid,

22), instead, she proposes *'...a critical form of posthuman theory and affectively a form of caring disidentification from human supremacy'* (ibid, 22). Suspecting that her discomfiture with *anthropos* is because it is male gendered, nevertheless Braidotti's suggestions usefully complete a depiction of posthumanism.

Interposing, it is reminisced here that Luhmann effectively disinherits *ανθρωπός* in his systems-theoretical vision, replacing the person by communication. It characterises him as posthuman also, and this ensures theoretical consistency throughout this study.[55]

Part III

From observing to being. From outside to inside: radical transformations

The observing modes 'human, inhuman,[56] transhuman and posthuman' impressed initially here as a progression of observational platforms, vantage points or frames of reference contemporaneously with the co-evolution of human kind and the Anthropocene. In the order in which they were presented and according to the mien of this discourse, they moved through gradual transference of human influence to that of technology.[57] Concomitantly, they afforded a socio-historical narrative of the ethics of human behaviour in respect of their fellows and the environment. In observing their observing, nothing suggested their fundamental being had changed apart from the accumulation of knowledge; they were observers observing according to their role-playing 'labels'.[58] Processually divesting themselves of that through communication, they would be ready to observe again. Observation utilised them categorially as a blend of instrument and resource. Nothing would prevent them from observing in other arenas subsequently. So, it seems that observers have been depicted, reductively, as peripatetic, 'jobbing', external, impartial and hypothetical. Observing therefore constitutes their 'jobs' but limits of empiricism and constraints on epistemology inhibits their scope.

Repositioning the narrative

The ramifications of Haraway's proposal greatly exercise the imagination. It is axiomatic from her cyborg thesis that human actors would *become* posthuman. This is a radical metaphysical transformation of the hereto separately identifiable human and machine into an integral, single machine-person being – no hybrid but a fusion – and inscribed on society as universal. As between human and machine-derived intellect, the functioning of this new being would be indissoluble.

The recent discourse, though, makes it seem as if the only possible destiny for humanity is the posthuman. It is an engaging imaginary but its protagonists can be tendentious. The Anthropocene will continue to witness outrage perpetrated on the environment and posthuman scholars have been silent on *how* harm might be slowed, ameliorated or reversed. If posthumanity were to represent the ultimate in anthropological progress, the three other modes of observing would be de-substantiated. But posthumanity does not (yet) represent the entirety of relations of humankind to the Anthropocene, thus the methodology of inquiry here will admit, for the moment at least, the three other modes as potentiators of knowledge.

Observing: *volte-face*

To continue, the notion of *becoming* posthuman evokes a question arising from appreciation of *a posteriori* awareness of this as to whether, in turn, the human, inhuman and transhuman could be part of this becoming. If they could, then the manifestation of the Anthropocene would change from that merely communicated by empirical observers to one of *embedded beings* that relate to the *Κάινος*, each in their specific ways.

Put differently, the erstwhile modes of observing can now be regarded as always already states of *being*, an emergent new methodology questioning *how* observing will be done. The previous distinctions become states of *being* or of ?ντος.[59]

Then, not only does the original observer's role become redundant but also can no longer exist because only the four ontological states are possible; there is no longer an 'outside' from which observing can be conducted. So, the notion of the impartial peripatetic jobbing observer choosing the mode by which to inquire has evaporated.

From this, observing as the external witnesser of events and *how* they are observed would cease and instead devolve from the *relationship*[60] of the human to the *Κάινος qua*[61] human; the inhuman *qua* inhuman; the transhuman *qua* transhuman and the posthuman *qua* posthuman. Then the transhuman, to take an example, *becomes* a being that operates entirely on the basis of the relationship of man to technology in the Anthropocene. Germanely, there is proposed a radical change from observing *how* the four observational modes have impinged on the Anthropocene to that of their experiencing the Anthropocene *as one of them*.[62]

The ontological turn: transforming observing

There are now questions of the nature of inquiry amid the ontological turn,[63] *how* it would function and *how* it would inform. Each of the previously indicated modes now becomes instead a *being* uniquely ensconced in its own form. More than just semantically, 'form' now requires specific understanding as a drawn distinction in the manner of George Spencer-Brown (1969) that foregrounded Luhmann's work. In Spencer-Brown's thesis, observing is infeasible without making a distinction. According to him, an observation is indeed synonymous with *the indicative or one-sided use of a two-sided distinction or 'form'* [64]

The distinction of these new distinctions indicates that external observers of the form will be precluded because they cannot be of like form, otherwise they will be of the form; and if they are of unlike form, they cannot observe within the form because they are different. So transformed, each can observe only according to its normativity – the human entity observes only through that which makes it human, and so on. Repeated correlation of the human relationship with the Anthropocene via the normativity of the form stimulates recursive self-reference. Operations with regard to events in the Anthropocene can be endorsed as pertaining to a form through normative

reference, which is autopoiesis. Recursion creates a discrete boundary for each form and demarcates its interest. It is also ontologically true that a being can be of only a unique form and therefore has no like.

Such propositions demand theoretical leaps. Observing is thematically integral with systems theory here and the driver of this study. In firmly prioritising observing and – in the manner of secondary observation – appreciating limitations of the initial methodological thought, the inquiry accordingly has sought means of deeper understanding.

Analysis of the changes should clarify *what* has been transformed and *how*: that is, the ultimate functions and relationships of the forms to the *Κάινος*. Relying on concatenated assumptions, first, the earlier characterisation of external, perspectivised observers has been supplanted by that of ontological, subsumed beings. Their functions have been exchanged from that of empirically observing the human, inhuman, transhuman, posthuman influences on the epoch to *becoming;* beings that are of the 'human', 'inhuman' form, and so forth, in relation to the *Κάινος*. They then experience the physical environment 'humanly', 'inhumanly', and so on, according to the nature of their being. They *live*[65] the Anthropocene integrally. They have relationships with the Anthropocene engendered by their cohabitation. As ontological beings of a specific nature, their interest concentrates until they recognise only events falling within their unique normative ambit. In the transformation, observing has moved from *outside* the Anthropocene to the *inside*[66] and the outside ceases to exist. *Post haec*, normativity accrues from what it is to live 'transhumanly', 'posthumanly' and the rest, so the specificity of the forms' experience increases with recursive encounters, which corresponds to increasingly autopoietic operation. It parallels systems theory but has arisen through the unique circumstances of inquiry into the Anthropocene. Necessary for conviction by it is acceptance of the transformation of observers into forms that emulate sub-systems of society.

Another gain is to be had in information and hence knowledge via these transformations. Luhmann does not characterise observers other than to state that they observe according to the distinction that separates systems functionally and that secondary observers observe *how* this is achieved. Nothing is surmised about their nature: Luhmann construes them only as beings that are not part of any system.[67] They are naturalised simply as animate entities with the capacity to observe. This underpins the earlier construal of the 'peripatetic jobbing observer', because it is hard to imagine any other character that could be assumed, prior to the presaged methodological shift. In the new proposition, though, observing forms take on the character of their own function as they live them within the *Κάινος*.

Normativity, reflexivity, affirmation: Reconstituting observation

Correlating relations in the Anthropocene with the normative standards of each form represents the new methodology of inquiry. It might beguile those trying to look in. Recursive reference of events to standards within the anthropological framework produces normative closure of the forms such that they appear to have become insular, though it is recursive reference that defines their insularity. The anthropological forms in society constitute distinctions, each from the other and collectively; not only that but also ontological beings have substituted for peripatetic observers. The attributes of the new beings derive from their relationship with the Anthropocene.

But uncertainties are ascribed. Earlier, the discourse asserted that the anthropologically characterised Anthropocene lost the outside from which observers could look in, so the theory of observation immediately is bereft of an observer. Next, it is not certain *how* ontological beings communicate with the outside, even supposing the nature of that outside were known. And an anthropological form also will be impervious to inquiry by other distinctive forms because its operations will not be understood by them.

However, we cannot have come this far and learnt nothing. Some wisdom of the past still can apply. Important is that of *reflexivity*. Recalling this injunction, the present narrative counsels that beings within forms reflexively can review their own operations. Amid ontological affirmation, they can undertake *reflexive self-audit*[68] of their methodologies as part of their ongoing introspection. For instance, internal reviews could amend normative values if it should be required to refocus them. That way, forms would evolve continuously. In turn, methodology would become progressively more adequately complex, that is, enhanced normative values would be more adequately prepared for evolving relationships between forms and the Anthropocene. Now, convergence is identified with the principle of autopoiesis in that reflexive self-audit is akin to it, operationally, with the addition that self-audit imposes discipline on the process.

Repositioning communication: transcendent *academe*

In reprise, in the configuration where each form is normatively closed though cognitively open to anthropocenic events, absent an outside(r) there is no identifiable means for beings to communicate their sensation of operating in this fashion. There is also a question of to whom beings could communicate because the recently espoused theory is invulnerable to the notion. There must also be clear differentiation between whether discourse concerns autopoietic forms of being that communicate on a normative basis and discernment of *how* observing can be communicated after the observer has been transformed and moved inside.

A*cademe* is the arch-inquirer/communicator/disseminator of **knowledge** – a *rapporteur par excellence*[69] and prospectively neutral. It comprises a group of beings whose intrinsic nature is inquiry, with communicating deeply embedded in their essence. Because of its compulsion to understand the world abstractly, *academe* will be able to inquire into the life of the four ontological forms and even to undertake critique of the reflexive self-audit of their methodologies. *Academe* can then be reckoned *transcendent* among them, never embroiled in

them but never external to them either and able to inquire into any of them without changing its innate nature. It would embrace revelations about the relationship of forms to the Anthropocene. And, so bestowed, this attention endows communication with academic rigour.[70]

It is presumed in this essay, too, that *academe* is the least likely to be enthralled by Haraway's cyborg posthuman, for the important reason that the former protects vigorously the capacity for independence in its observing. This amounts to more than mere Enlightenment enterprise and constitutes inquiry more appropriate to the excesses of the modern age. It is capitalised on in this study as overarching, where inquiry into any *Κάινος* is predominantly cerebral and cognitive.

Retrieving second order observation

Doubt over receiving communications from the inside(r) having been remediated by the inception of transcendent *academe*, it can be imagined, conterminously, that it would be ideally situated to observe *how* the new beings would observe their relationship with the Anthropocene, *not just the observations themselves*.[71] This amounts to second order observing, the cornerstone of methodology in inquiry. The reputation of *academe* as *raconteur par excellence* has been upheld; second order observing has been retrieved. The *how* of observing once more is proclaimed as the essential means of attaining deeper understanding.

Luhmann (reprise), posthuman scholar

Another convergence of theory occurs in this inquiry. Luhmann decentres the human in his theory of social systems that are distinguished only by their function. Humans are supplanted by communication. This marginalisation of humans characterises Luhmann's theory posthuman (Lovasz 2018). There is therefore a productive association between Luhmann's account of society and that of the posthuman entity amid the Anthropocene. It signifies consistency and equilibrium between the methodological assertions made here. Both rely constructively on self-reference.

The fit of systems theory with a naturalistically constructed methodology

Initially, the approach to inquiry into the Anthropocene appeared a clear matter of observation. Mundane, yes, but a methodology quickly was developed through second order observing that ordained *how* observing could take place. As has been said, Luhmann's systems theory was the inspiration for this but, also, it evolved naturalistically. Imagining the ontological beings that would inhabit the Anthropocene suggested they would become autopoietic because they would constitute observers who communicated only according to the normativity of their particular existence. Reflexive self-audit of an observing system is redolent of the operations of autopoiesis. Thus, there is congruence between systems theory and those developed naturalistically and consequentially here. It is as if the Anthropocene has mandated the (adequately complex) methodology for its own contemplation. The inculcation of autopoiesis is axiomatic of this self-development. Luhmannian systems theory therefore not only formed a strong theoretical grounding for inquiry into the *Κάινος* but also accompanied the formal operations of its discovery.

Communication *per* Luhmann. Infiltrating the posthuman *per academe*

Regarding communication, because it is doubly contingent, there must exist a being able to receive, understand, deconstruct and respond to what is communicated (Vanderstraeten, op. cit. 2002). Without this, communication would not succeed but *academe* can operate in the role of both communicator and *communicand*. To elucidate, transcendent *academe* would conduct inquiries and communicate conclusions to its community through publication and lectures – its means of expression via its standard methodology.

Recipients of communications are *communicands*. There is no occasion to seek an outside(r): *academe*, as depicted here, can permeate the inside transcendently and move among its structures. At the same time, it represents the portal for transmission of knowledge and understanding to the world, this provided *academe* is not transformed into digital versions of itself and can preserve its distinction. In that ontological dress, a*cademe* can infiltrate the posthuman and other forms in the Anthropocene without compromising its immanent character[72] and has the potential to communicate aspects of the Anthropocene through good journals.

Though Gladden (ibid, 2018), disparages the role of academe amid the posthuman especially, Ferrando (ibid, 2013) and Siddiqui (ibid, 2016) find reasons both to encourage and emphasise its need. Ferrando (ibid, 32) considers the notion of posthumanities has been welcomed in academia to emphasize an internal shift from the humanities to the posthumanities, extending the study of the human condition to the posthuman. *À propos* Siddique (ibid, 2016, 62–78, 74), a nexus exists between her concern over the posthuman and that for the discipline of education. Citing her opinion directly here, she says,

> 'The vitalist materialism of Braidotti's posthumanism suggests that matter self-organizes and there is no need for an agentic subject to intervene.' 'However,' she asserts vehemently, '*It is the business of academe to intervene*.'[73] She continues,
>
> 'Academe's scholarly, curricular and instructional structures require zoe, or the raw cosmic life force in matter, to present itself in forms that can be learned and manipulated by the agents of higher education. Thus, visions of "posthuman humanities" must address the expansion of sense experience in posthuman empiricism, as well as the formations of posthuman subjectivities, and what all of this may mean for the present agents of higher education.'

In terms of the work here then, Siddique's agents of higher education become empirical posthuman observers especially able to cognise and communicate.[74]

Ultimacy: *academe* and utopian posthumanity

Posthumanism and transhumanism frequently are projected theoretically as *utopian*. Views abound on the nature of utopia and the possibility of its existence. Bostrom (2008) outlines the conditions for realisation of it in life. In economics, Barnett and Morse (1963/2001) define utopia as the situation where 'society has free and costless access to an infinitely large stock of currently unused natural resources.' Arias-Maldonado (2020) comments on aspects of the 'Green Utopian Fantasy' amid the Anthropocene. Michael Hauskeller (2012: 41) compares it to the mythical land of Cockaigne and declares the transhumanist account of posthuman existence an 'obvious wish-fulfilment fantasy'. Speculating enthusiastically that the world might evolve ultimately into a comprehensively posthuman condition, Gladden, (ibid, 2018), relying on Herbrechter (2013), speaks of 'technologized posthumanism' as

> 'a group of fields that are on the vanguard of the technologization of academia. Posthumanities of the latter sort advocate the replacement of "analog" [sic] or literacy-based knowledge structures with virtualized digital collections of data.' (ibid, 53).

Coenen (2007) deliberates exhaustively on utopia amid 'converging technologies'[75] but disparages the role of academia in clarifying the interrelations of the utopian tradition, 'technofuturism' [*sic*] and Science and Technology, which is driven by advocates of opposing traditions. *How* utopian perspectives influence the operations of *academe* amid posthumanism are therefore crucial to the potential for inquiry.

Utopian conjecture can be problematic[76] and hyperbolic outlooks sometimes the product of fantasy.[77] Implied idealistic perfection can be difficult to imagine. Nothing in the Haraway/Braidotti/Hayles theses that decentre ανθρωπός necessarily suggest attainment of an ideal or ultimate state, even though they might consider the world improved by their suggested transformations.

Reified, a theory of utopian posthuman existence could have significant consequences for inquiry within the Anthropocene. Utopia could forfend inquiry by *academe* on the basis that everything is optimal. However, in this imaginary, is it implied that humans will no longer be subject to cataclysmic environmental events? The futuristically enhanced capacity of posthumans might mitigate some of them but much depends on whether environmental harms can be remediated in posthumanity or that it is not already too late for some of them. Is it really that, rather than signifying salvation through a posthuman utopia, extinction is inevitable? There is a disconnect between the theory and the possible reality.

Allowing free thought for an instant, in a contest potentiated between the threatened extinction of species from climate change (Urban, 2015) and a utopian existence where all life's problems are resolved, which would attest the ultimate truth? The issue would provide rich grounds for observing amid an appropriate methodology, except that, on one account, the observers themselves might perish in the process.

Recovering the narrative, if posthuman sensing in utopia were the panacea for all human problems, might not the circumstances of the Anthropocene eventually evaporate and be substituted by a new geological stratum reflecting the next Κάινος? (Suggested: στρώμα όντων (stróma ónton: 'layer of beings'), or, freely adapted, 'ontocene').

Speculation indeed but it could be real. If the world's environmental problems could be relegated to insignificance through a truly utopic state, might it then be unamenable to academic inquiry on account of the following? Systemic problems absented due to supposed optimisation could signify reduced internal anthropocenic dynamism moving towards entropy. Then, regardless of methodology, there would be no events or phenomena into which to inquire, thereby obviating the necessity.

If a state of utopia is an elaborate fancy, then it represents no more than a distraction. If real, it could constitute an obstacle to inquiry and its relationship to *academe* then would be crucial. However, of Gladden's view of posthumanism as substituting '*virtualized digital collections of data'* for human inquiry (ibid, 53), the present study advises that, seen this way, utopic posthumanism would deprive it of intellectual reasoning. Making use of data requires cerebral engrossment. With the posthuman being regarded as no more than a super data-gathering entity, *academe* consequently would be impoverished.

Notes

[1] Author assertion.
[2] https://www.qualityresearchinternational.com/socialresearch/theoryladen.htm.
[3] Author assertion.
[4] en.wikipedia.org>wiki>Methodology.
[5] Author assertion.
[6] https://www.merriam-webster.com/dictionary/methodology.
[7] This is so important that the word '*how*' is artificially italicised throughout the text.
[8] "Empiricism." *Merriam-Webster.com Dictionary*, Merriam-Webster, https://www.merriam-webster.com/dictionary/empiricism.
[9] Often, this is undertaken by sociologists of science who have an appropriate basis for observation and the tools for it.
[10] The interested scholar also might like to read the commentary on Luhmann's systems theory thinking in Schwanitz, D. (1995). 'Systems Theory According to Niklas Luhmann – its environment and conceptual strategies.' 30 *Cultural Critique*, 137–170.
[11] This is substantially true but examination of *how* students observe is not often systematised. It might be more informative if it were.
[12] Published peer-reviewed articles and books, reports and other material as academic output.
[13] In science, validity concerns whether the outcome measures what was intended to be measured. Biases and flawed methodology challenge it.
[14] See also Page, M., Galen, G. and Timmreck T. (1995). *Basic Epidemiological Methods and Biostatistics: A*

Practical Guide Book. Boston, MA: Jones and Bartlett Publishers.

[15] See, for instance, Flaherty, D. (2011) 'The Vaccine-Autism Connection: A Public Health Crisis Caused by Unethical Medical Practices and Fraudulent Science' 45 *Annals of Pharmacotherapy*, (10), 1302–1304.

[16] For the interested reader, Richard Horton (onetime editor of The Lancet) gives an account of the retraction of the article published in The Lancet in 2004. (Horton, R. (2004) *MMR. Science and Fiction. Exploring the Vaccine Crisis*. London: Granta Publications.

[17] Previously known as 'Shaken Baby Syndrome'.

[18] *R v Clark* [2003] EWCA Crim 1020.

[19] For discussion, see also http://news.bbc.co.uk/1/hi/england/2698425.stm.

[20] Royal Statistical Society Statement regarding statistical issues in the Sally Clark case, October 23rd 2001 at http://www.rss.org.uk/uploadedfiles/documentlibrary/744.pdf.

[21] De-differentiation of social systems can be attempted when their normative closure presents difficulty in explaining occurrences that can be described by more than one system, such as when scientific evidence is admitted into court during a legal dispute. De-differentiation could allow scientific evidence to become the arbiter of legal decisions, which would de-innervate law. This is regarded 'illicit' here as it offends against the theoretical constructs of social systems. A useful discussion of the implications and effects of de-differentiation in planning can be seen in Van Assche, K. and Verschraegen, G. (2008) 'The Limits of Planning: Niklas Luhmann's Systems Theory and the Analysis of Planning and Planning Ambitions'. 7 *Planning Theory*, 276–278. The problems discussed are universal to de-differentiation of any system in society.

[22] Enlightenment over the philosophy to be adopted when courts are faced with scientific/medical expert testimony can be gained from The United States Federal Court of Appeals case of *Daubert* (Daubert et Ux., *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993); thus, '[…] faced with a proffer of expert scientific testimony […] the trial judge […] must make a preliminary assessment of whether the testimony's underlying reasoning or **methodology** is scientifically valid and properly can be applied to the facts at issue. Many considerations will bear on the inquiry, including whether the theory or technique in question can be (and has been) tested, whether it has been subjected to peer review and publication, its known or potential error rate and the existence and maintenance of standards controlling its operation, and whether it has attracted widespread acceptance within a relevant scientific community.' (C592–594). [Extracts from Judge's speech].

[23] The time denoted by the deposition of the geological layer that equates to the existence of human life on earth.

[24] https://www.nationalgeographic.com/news/2010/4/100406-new-earth-epoch-geologic-age-anthropocene/.

[25] See, for instance, Tin, T. Fleming, Z. Hughes, K, Ainley, D. Convey, P. Moreno, C. Feiffer, S. Scott, J. and Snape, I. (2009). 'Impacts of local human activities on the Antarctic environment'. 1 *Antarctic Science*, (21), 3–33.

[26] This emphatic comment pertains more to anthropological observation than those of earth sciences.

[27] See Baucom, I. (2012). 'The Human Shore: Postcolonial Studies in an Age of Natural Science', 2 *History of the Present: A Journal of Critical History, 2*(1), for an interesting discussion of the intersection of human history with geological time.

[28] https://www.britannica.com/summary/Holocene-Epoch.

[29] This effect is universal among social systems. For example, economies are now chaotic due to the effect of financial markets, over-lending and excessive speculation.

[30] It is acknowledged that discussion in Kotzé refers to environmental law but there is a generality in Philippopoulos-Mihalopoulos's remarks that can be applied to consideration of the Anthropocene regardless of the field to which it obtains.

[31] This philosophical term is used here initially as a fact or occurrence that can be observed, which accords with the present narrative, but the definition needs extending to something perceived or experienced, especially an object apprehended by the human senses. https://www.britannica.com/topic/phenomenon-philosophy.

[32] The inference of the term 'complex' is as consisting of many interconnecting parts and not, as often understood, difficult. The human neural network, for instance, is highly complex.

[33] Regarding the *Research Excellence Framework (REF)*, *supra*, observers can observe only through the three enumerated windows (separately). Also, they must be the peers of the authors or such observing will not be adequately complex.

[34] This is largely the area of study of the cited work.

[35] Repetition intentional.

[36] 'Autocritique'?

[37] For instance, empirical inquiry still is useful for government or committee reports, where absolute data is required.

[38] The Anthropocene sometimes can be imagined organic, in that it can respond to human influence, especially in relation to the environment. It is not truly animate but can behave 'as if' so. In a long-term view, beneficial or detrimental environmental responses to human intervention could affect what is laid down in the geological layer as a record of that human agency.

[39] *Kainos* (Gr.) literally implies the current epoch but, as it is used here, often is meant to imply 'newness'.

[40] See, for instance, Mc Neil, J. and Engelke, P. (2014) *The Great Acceleration. An Environmental History of the Anthropocene since 1945*. Cambridge MA & London, England: The Bellknap Press of Harvard University Press. See also Whitehead, M. (2014). *Environmental*

Transformations. A Geography of the Anthropocene. Abingdon: Routledge.

[41] Author emphasis.

[42] Meaning 'of doubtful truth'; not necessarily consisting of problems.

[43] Author emphasis.

[44] Cavendish's original text on Experimental Philosophy can be read in O'Neil, E. (ed.) (1666/2001). *Margaret Cavendish: Observations Upon Experimental Philosophy,* Cambridge: Cambridge University Press.

[45] For example, the simple, 'into what should we inquire', always already expresses human influence.

[46] Author's choice of expression.

[47] Present author emphasis.

[48] Apologies from the author for trying to be ironic himself and just a little tongue-in-cheek!

[49] The acronym for *Completely Automated Public Turing Test to Tell Computers and Humans Apart*.

[50] For interesting discourse on the futures of advanced and human-replacing technology, optimisms and pessimisms with regard to economies and employment, see Trajtenberg, M. (2018). 'AI as the next GPT: a political-economy perspective', *Working Paper 24245*, Cambridge MA: National Bureau of Economic Research http://www.nber.org/papers/w24245 DOI 10.3386/w24245.

[51] Rory Cellan-Jones, *Stephen Hawking warns artificial intelligence could end mankind*, BBC News (Technology) 2nd December 2014 https://www.bbc.co.uk/news/technology-30290540.

[52] The issue here is whether transformation of the human in posthumanism would make him/her into an equally Frankensteinian creation due to symbiosis with an entity that has no feeling.

[53] Author emphasis.

[54] This almost incidental mention conceals grounds for a new study, for which there is no present space. Suffice it to say, *pro tem*, that, whereas observation and communication can be ephemeral, self-learning for ontological beings comprises memory, so that knowledge accumulates. From this can arise wisdom. This is not within the scope of the peripatetic jobbing observer (q.v., *infra*).

[55] For those interested in the more arcane aspects of Luhmann's theory of communication, see Borch, N. (2011). *Niklas Luhmann*. (Key Social Series Editor Peter Hamilton). Abingdon: Routledge, in which he comments: '[…] it appears even more astonishing when Luhmann at the same time centres his systems theory on the notion of communication and argued that it is not humans or subjects that communicate, but communication itself'.

[56] With its attendant semantic confusion.

[57] Actually, 'human' and 'inhuman' are introspective modes; 'transhuman' and 'posthuman' are prospective.

[58] At the risk of repetition, observers are characterised by *how* they observe.

[59] Gr: Being; existence.

[60] Author emphasis.

[61] Author emphasis, *et seq*.

[62] Further author emphasis.

[63] There is a turn to ontology in this *excursus*. Unmistakably, it is also anthropological. It coincides with wider developments in contemporary philosophy and social theory, so this study has made its own turn against a background of a modern theoretical trend. For elucidation, see Holbraad, M. and Pedersen, M. (2017). *The Ontological Turn. An Anthropological Exposition*. Cambridge: Cambridge University Press.

[64] See also Laermans, R. and Verschraegen, G. (2001) '"The Late Niklas Luhmann" on Religion.' *Social Compass, 48*(1), 7–20. Not only does it provide a more accessible overview but also it affords a simpler explanation of form.

[65] Author emphasis.

[66] Author emphasis.

[67] But see the discussion in King, M and Thornhill, C. (2003*). Niklas Luhmann's Theory of Politics and Law*. Basingstoke: Palgrave, Macmillan, 6. Luhmann's answer is to see the individual as an observer of society, but not having an existence within society. 'The individual leaves the world in order to look at it. He does not belong to any [social system] in particular, but depends on their interdependence.' Individual consciousness then clearly observes society and is dependent upon society, but it is not, in Luhmann's scheme, part of society'.

[68] Author emphasis.

[69] Author emphases.

[70] *Academe* also can evaluate the operations of the forms and methodologies, and combine and compare the conclusions of the forms through this latitude.

[71] Author emphasis.

[72] To regard *academe* as immanent is not to contradict its character as transcendent in inquiry among the ontological states. Immanence is a methodological reference to academe's normative inquiring, whereas it operates transcendently among the ontological forms in communicating reality.

[73] Author emphasis of this fundamentally important point.

[74] It is reasonable to assert a nexus here between research and teaching amid the posthuman. The former communicates information to the latter.

[75] This concerns new technoscientific synergies. The Converging Technologies concept further accentuated the coalescence of originally distinct branches of science and technology (S&T). See, especially, fn. 140.

[76] That is, of doubtful truth.

[77] That is, not theoretically grounded, polemical, imaginative.

Dedication

This study is dedicated to the memory of Professor Reza Banakar, lately of the University of Westminster, for whom methodology in inquiry was so important.

Acknowledgements

I am grateful to Professor Andreas Philippopoulos-Mihalopoulos for inviting me to contribute to this new and exciting journal. My thanks also are due to the

anonymous reviewers of the text who have provided such encouragement. I wish to thank especially Eleri Kyffin, Senior Academic Liaison Librarian at the University of Westminster for rooting out an obscure reference that transpired to be her master's dissertation from an earlier time.

Competing Interests

The author has no competing interests to declare.

Author Contribution

The work is a monograph. Some new ideas are my own but, *in summa*, the text represents a distillation of theories and concepts gathered from erudite colleagues and other distinguished scholars to whose outputs I have referred. The *excursus* would not have been possible had I not been able to rely on them.

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How to cite this article: Gilson, C. C. (2022). Observing Amid the Anthropocene: An *Excursus* in Methodology or the *How* of Inquiry. *Anthropocenes – Human, Inhuman, Posthuman*, 3(1): 4. DOI: https://doi.org/10.16997/ahip.1045

Submitted: 25 March 2021 **Accepted:** 19 May 2021 **Published:** 28 March 2022

Anthropocenes – Human, Inhuman, Posthuman is a peer-reviewed open access journal published by University of Westminster Press.