



Social Complementarity – the Duality of Individual Objectivity and Group Uncertainty

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Abstract:

Calculus is seen as describing continuous functions through the act of breaking them down to the smallest possible parts, suggesting that the whole is only an aggregation of its parts. But modern science has demanded the creation of new kinds of measurements, where the deterministic rules of classical physics cease to exist and we can no longer see the individual member parts as sole explanations towards the continuity of the whole. There is a duality between states of dis/continuous being, and we seem to be doomed to only see the measured discontinuous version grounded in our own objectivity. But can the knowledge of this duality maybe help us better understand the social consequences of our world's massively intraconnected social order? With the infrastructure of modern trade, seemingly instant communication possibilities, and newly created tribes numbering beyond what we thought possible; we have created a world that seem to defy our preconceptions of what social groups and responsibility means. Using agential realism and its groundbreaking insights into quantum philosophy with the idea of complementarity, I think we can start to understand these new states of being, and with it bring about a better grasp of the ethics that are an intrinsic part of all. Setting a foundation for how we can understand the duality of groups and individuals across all areas of our world, seeing complementarity as the grounding state of un/certain objectivity.

Keywords: Group agency, responsibility, agential realism, complementarity, social ontology

Discussions about human groups have long been important for philosophy, and span a wide area including the ontological, epistemological, and ethical. With grounding questions such as what actually forms a social group and if they exist as an entity and agent in their own at all, as well as ethical and political questions such as if social groups bear responsibility for actions

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made in their name, or if the individual members are the ones that should be assigned responsibility towards actions taken. Complicating matters we see that these past few decades our society and the groups that are created within have changed appearance dramatically. With an exponential growth of possibilities in areas such as communication, trade and international politics around the world, the size and amount of social groups have grown to volumes and structures never seen before. With this I also see a need for a properly grounded understanding of measurements and objectivity about what groups are and do, as fundamental rules we previously took for granted appear to change when regarding the very large or the very small. I believe a modern view of metaphysics, based on recent findings within quantum and relativistic physics, could overcome a lot of problems previously presented within the modern literature on social groups.

One question often discussed in philosophy is if we can see groups as an emergent and autonomous entity in its own or if they are only reducible to their parts. A divide between fundamentals that can be seen in many philosophical areas; atomism and holism, continuous and discontinuous, or even realism and antirealism depending on perspective. A divide often seen as impossible to bridge in recent Western literature, where you need to choose either one or the other. In Philip Pettit and Christian List's book *Group Agency: The Possibility, Design, and Status of Corporate Agents* they investigate the possible autonomous agency of social groups and if they should be regarded as an individual entity or not. And even if they only regard it as an epistemological foundation and not ontological (List and Pettit 76), they come to a grounding, and I would say ontological, the conclusion that social groups are autonomous agents in their own right; that they are not always possible to determine only with regards to their members (78). Jennifer Lackey has also chosen to see group agents from an epistemological perspective, seeing the divide between the different approaches first as that of summativists or non-summativists (Lackey, *Essays in Collective Epistemology*), and later as deflationary or inflationary (Lackey, *The Epistemology of Groups*). Another growing field alongside these epistemic discussions is that of social ontology, even if questions about social categories seen as natural categories appeared already in the writings of Marx and Nietzsche (Epstein). An ontological focus on social groups and structures can be seen in an article by Katherine Ritchie's, describing how structuralism has been discussed within philosophy and sociology, where the latter defines them as "anything that is the result of human action, as opposed to some naturally occurring phenomenon" (Ritchie 405). Here again creating a divide between the social groups we are trying to describe and those that are not seen as important, namely the "natural" ones. Trying, just as List and Pettit, to pinpoint what a human social group is and how we can define it by separating it from other kinds of groups that do not belong. This ontological question of group existence itself can also be seen as divided between the "easy versions" of ontology, meaning that they only concern questions of existence, and tougher versions concerning an idea of a complex ontological foundation that can be analysed (Flocke and Ritchie). An idea I also see represented in the common separation of epistemological and ontological debates, and an unnecessary separation when viewed through another lens of quantum interpretation.

The research area of theoretical physics has been through several changes in discourse since its beginnings. What started as highly philosophical discussions about possible consequences of new mathematical findings made by many people throughout the world, developed into applied physics where only direct results mattered, not their meaning. Since the 90's though there has been a comeback of science-philosophy, and one of the early contenders is particle physicist Karen Barad, that

has spent decades continuing the work of Niels Bohr's philosophy of science. Barad has attempted to give new meaning to quantum interpretations, and their use in philosophy and other social sciences (Barad, *Meeting the Universe Halfway*). This past decade we have also seen other attempts at reconstructing the quantum debate from physicists like Carlo Rovelli (Rovelli), or the developing field of Qbism (Cordero). One important trait they all have in common is a focus on the uncertainty of results that are produced from quantum experiments. Or in Barad's case the *complementarity* results, shown first in the double slit experiment¹ giving us two different kinds of results contingent on the setup of the experiment. Resulting in different but both objectively true conclusions depending on how the measurements were made.

Barad shows how much of western philosophy have been influenced by the idea of classical physics as fundamental rules of the universe, and how modern experiments have instead shown that these older deterministic rules are neither universal nor foundational. Understanding the difference between classical and quantum can help broaden our methods for understanding agency of both individuals and groups. Atomism and holism does then not seem to be mutually exclusive, but instead seen as complementary, equally important and true in their own, in accordance with Niels Bohr's complementarity principle. Without the habitually separation of things it becomes easier to identify new properties of both groups and individuals when seen as created dynamic entities, as we can leave behind the usual dependence on human individual agency and rationality for a more open and general approach. The individual perspective differs from the group's, in a similar manner as we separate particle or diffractive results and with a focus on their respective spatial and agential separability (Barad, *Meeting the Universe Halfway* 175). The focus within social ontology has mostly been on the *structural* formation of the group as such, almost always from the sole perspective of human individuals and what traits we would be able to directly transfer from the individual members to a grouping of the same. Importantly these are almost always human traits that we try to fit onto the different kinds of social groups, fitting a human defined agency. Two of the major contributors these past few decades have been Margaret Gilbert's *Sociality and responsibility: New Essays in Plural Subject Theory*, and *Group agency: The Possibility, Design, and Status of Corporate Agents* by Philip Pettit and Christian List; two books with different perspectives but often with the same conclusions regarding rules on when and how a group is formed based on number of individuals, through an idealistic filter. There have been a lot of commentary these past few years divided between the epistemological and ontological, two areas that have a lot in common and should not be separated. Just as Bohr might see the act of measuring being entangled with the measured entity, Barad's ethico-onto-epistemological method describes a fundamental idea of the entangled and constantly intra-active state of the human and non-human (Barad, *Meeting the Universe Halfway* 90).

What possible implementations are there of viewing groups and individuals as complementary domains? There seems to be a call for a common vocabulary within several different areas discussing agency for individuals and groups. For instance with the rise of AI and robotics the questions of agency of man made machines have become an important, but often confusing, debate that needs clarification (Thellman et al.). Also in a world of a growing human population and seemingly sparse resources, there is a need for a better understanding of intersectional studies, helping us understand how groups affect and steer our communities, with emerging problems of structural inequality, material consequences, and individual responsibility within our human life on this planet (Zheng).

The search for our tiniest parts

Ideas about how to leave the binary world of linear causation have been many, ideas that can be found in many places outside the world of western philosophy. From within there have been several important voices; Bohr spoke about the importance of human measurement, Darwin described the world as a tangled bank of dependant co-existence (Plotkin), and complex nonlinear actor-network models are on the rise for describing everything from human interference on riverbeds to our magnetosphere (Tsonis). All valuable insights into the complicated world we live in, but all with a common grounding in preexisting and discrete interacting entities situated in space, both human and non-human, natural and cultural. The work to bring them together is important and successful, but what Barad brings is a different kind of understanding about how we create these entities in the first place. And that we are not interacting, but intra-acting in continuously iterative mattering matters (Barad, *Meeting the Universe Halfway* 234). Continuity has long been an important concept for both mathematics and philosophy. The classical paradoxes of Zeno debated the question over two millennia ago, while mathematicians have struggled to solve continuous functions during most of the time since. It was first with the advancement of math into the realm of infinitesimals that many started to see calculus as being able to analyse these curved functions. Before this we were only able to describe our mathematical world discretely with impossibly flat triangles and perfect circles; entities that do not even exist in our world of non-zero gaussian curvature (a world that isn't two-dimensionally flat). A triangle's corners never has an exact sum of 180 degrees, as the more we zoom in the more topological variance is found that adds or retracts some degrees. But with the help of infinitesimals we were finally able to analyse more than just our shadows on the cave wall; as it was believed that these smallest possible pieces of mathematics turned the tiniest quanta of information from ragged rectangles into smooth representations. The variables went as close to zero as impossibly possible, and in most cases it was close enough.² This trick of calculus was seen as continuous, and it could then be argued that if we broke down the path of Zeno's arrow into these iteratively smaller and smaller steps we would end up with a continuous path and the arrow would reach its target. Calculus could analyse the continuous function, and all kind of problems that previously had been difficult or impossible to solve suddenly became a lot easier. We could not only track and predict the trajectory of an arrow, but started to better understand growth, fluid dynamics, waves, weather and other complex matters.

As a contrast to these dis/continuous transformations, quantum mechanics introduced a new concept that would become one of the most important discoveries of the 1900's, namely Planck's constant. A constant that is so small it is practically impossible for humans to understand as a quantity,³ but a constant still proven to be fundamentally needed in order for quantum measurements to make sense. The quantum world measurements did not seem to be built of continuous movement, it was determined by the static packets of energy (quanta) that appear to move about without trajectories. As if teleporting between different static states. Quantum measurements do not make sense unless they include this tiniest constant into the mathematics, just as we can't "see" things without the tiniest photon being part of our observation to record information and bring back to our eye or instrument of choice (Barad, *Meeting the Universe Halfway* 113). The act of measurement seems to introduce discontinuity into the fundamental state of physics. As soon as we measure, our results become discontinuous and objectively possible to analyse, with the act of measuring being an intrinsic and entangled part of the measurement. Through this new mathematics Bohr was able to early on

predict that these quantum particles would result in strange behaviour depending on method of measurement, showing that for un/certain circumstances we instead saw a *superstate* of entangled entities. Quantum particles could behave as if they were continuous waves when introduced to the double slit experiment, as a dual and complementary existence of both the discontinuous particle and the continuous wave. Where experimenters expected to see classical results of particle trajectories according to Newton's laws, they instead saw that these quantum particles resulted in patterns of diffraction, something previously had only been seen in continuous waves. Long and sometimes harsh discussions followed about what this meant, and nowadays this duality of particle and wave behaviour has been proven to be part of all existing matter. All matter in any form can be described as either a particle or a wave. Creating a fundamental shift in our previous ideas of how a particle only exists in a certain spacetime position, and always able to track its trajectory both back and forward in time. With the possibility of behaving as a wave, the particles can enter into a state of superposition where they exist in different parts of space at the same time, creating the possibility for quantum entanglement (Barad, *Meeting the Universe Halfway* 270).

There have been several interpretations to describe what this idea of duality and superposition means, the most famous being that of Heisenberg's uncertainty principle, commonly telling us that there always remains an uncertainty in our different measurements. But also hinting that the results of our measurements are an intrinsic part of the individual particle in question; its momentum exists independently of measurement, just that we as observers remain uncertain of its value until properly measured (Barad, *Meeting the Universe Halfway* 116), values commonly known as hidden variables. In much of the philosophy of science literature this uncertainty has been viewed as interchangeable with Bohr's idea of complementarity, but Barad argues that uncertainty is only an epistemological idea of the possible state of things, while Bohr's complementarity is also ontological. The duality of states is an inherent part of the entities existence. When a measurement is needed we introduce discontinuity into the system, giving us the possibility for objective causality but removing the possibility of a quantum state of superposition. It is not possible for an entity to be in mixed state of the two (Barad, *Meeting the Universe Halfway* 269). So we have two states of which a mix is not possible, a kind of duality of nature it seems, between that of unmeasured and measured state. This duality of wave and particle has been discussed and argued ever since its discovery, and there is still no general consensus to what Bohr's or others thought of the reality of objects.

I believe this concept could be used in a wider sense for social ontology, where groups can be seen as entities in superposition, existing in and affecting many places at once without inherent causality, while individuals are measured entities with a clear trajectory of causal chains through time. And as I will discuss in the next part, all entities we want to measure can be seen as both groups and individuals, simplifying the chase for a universal concept of groups and eliminating some problems for the examples of group actions mentioned in recent literature. As I will try to show, a group is not simply created when two or more people gather with intention of a joint commitment (Gilbert 5). Analysing a group is something more than looking at its members, it has its own traits that needs to be discovered just like any entity. Its formation is not a binary creation that automatically happens when two or more people are together (Ritchie 403), just as two individual H₂O molecules do not create wet water when they come into contact with each other. It is what some would call an emergent effect happening without an exact number of individual members, happening when enough molecules are gathered in a specific order under correct circumstances and we as observers can identify these

new kind of traits. Dynamic circumstances that do not depend on a priori levels of observation. Just as social groups can start to exist as entities in-themselves in different sizes depending on specific situations and desired traits.

Individual groupings of individuals

We see an individual as entity with a unique place in space and time. When I as an individual start a specific action no one else can act at the same time and place, thus creating a possibility for an objective causal chain of actions. Using my own body and my life as a starting ground for the discussion on the individual versus the group is a good place to start, as it is something most have thought about. What is part of myself and what is not, and what is it that makes me alive.

When declaring death by heart attack we create causality; the heart stops beating causing the death of the person it inhabited. There are of course always many contributing factors such as air quality, diet and genes; but those can be seen as earlier parts of the causal chain that led up to the last part of the chain that is the heart stops working which then leads to death. Or simply collecting them all to be part of the individual action that caused death. We can however regard the heart as an individual organ, interacting with the other organs to create that which we see as a living person: the group of organs we call a body. The heart in turn is also a group in itself, made up of individual cells that all work together to function as one, together with gene expressions and societal impact. Each part of these groups have their own role and traits, together intra-acting to create a human with completely different traits than that of its parts. We could also add the microbiome of bacteria that break down sugar to make sure we have usable energy for the mitochondria to keep the cells active and working, or the muscles pushing food through our digestive systems, the oxygen firing the cells of the muscles, or even the geological processes that led to the creation of oxygen producing plants. If everything that keeps us alive would be defined as unique individuals this would quickly become a problem of infinite regress, something discussed by many philosophers throughout history often causing immediate rejections of an idea (Cameron), as it would lead to contradictions in deciding on its causal chain. What actually causes what? Classical physics and logic has an intrinsic need for actions to take place in a unique time and space, where it is always possible to decide which comes before the other. Creating a discontinuous pattern of points and vectors in a cartesian defined space of axis, all related to an imagined origin of zero coordinates (Svensson 22). For quantum physics on the other hand, this does not need to be a problem. The duality of superposition and classical positioning through Bohr's theory of complementarity tells us that not everything needs to be intrinsically defined as either an agent or not. When we don't introduce the act of measurement into a system, it remains in a state of uncertainty and entanglement, with its natural state resembling the bell curve of normal distribution. The most likely outcome is almost always the one we expect, but there are always outliers. Every set we create will never be able to capture all that we intend, be it biological, chemical or cultural. The more we learn about the fuzzy borders that exist on the smallest levels, the more uncertain these sets of things become. Spreading continuously as virtual particles always and never touching. Undoing the "foundational reductionist essentialism" (Barad, 'On Touching' 214).

So if my body can be functionally described as several different kinds of dynamic and iterating groups or an equally dynamic network of individuals, we could also describe a social group as intra-acting continuous people, whom are also individuals in themselves. Groups that only take on a definite form of a causal individual when measured. The different groups that comprise my body are seemingly

endless both in number and size, as we can move down to the level of quarks, or include culture and history. But at this stage it becomes difficult to discern the multitude of functions and roles, and it quickly becomes too abstract to see the whole of the human body through the incomprehensible number of actions taking place. We loose focus on the group we are wanting to measure and analyse. Even what is and isn't part of our body is not even a clear line; are for instance my bacterial biome part of myself? I could not live without them, but they can also be removed without instantly killing me. Or some cells that yesterday we thought were part of our body suddenly become alien and no longer belonging to what I call myself; something as simple as loosing a hair, or cells that refuse to self-destruct and can become malignant cancer. An exact place in space and time when this happens is impossible to pinpoint. Just as there is no specific limit for when a group of water molecules become something wet, it is something we must identify and decide through observation. Which brings me to the idea of traits of humans and the social group, and the possibility of transference.

Transferring traits

If I would propose an idea that my individual organs or cells could be described with traits such as responsibility or having a mind of their own, then most would surely find this absurd. But when we try to define and measure social groups constituted of several people this is what seems to be happening as a starting point of comparison. In the recent literature on discussing social groups it is almost always done with a human centred model; trying to describe social groups in the manner of human individuals. Such as trying to identify the human traits of remorse and guilt (Gilbert), or responsibility (List and Pettit) within social groups of humans. We use traits we have identified in ourselves and try to transplant them onto social groups in order to define them as being agents in their own or not. Mostly in order to try and create a universal idea of social groups that can include all possible social groups, an idea that has had difficulty holding up when tested on specific cases (Alexander and Morley 7958). Using one group to try and identify another unknown group is probably the only way for us to objectively understand it. But I do not think that using our human individual traits as the role model for other kinds of groups is the right way to go, as it limits us when measuring a group in ways that differ from ourselves. Instead we should see groups at a more abstract level, trying to identify the traits that we actually see and do not previously exist in the individual. New traits that have already been discussed in other areas of social and gender studies, such as structural injustice, language or class. This way of thinking is also happening in other parts of science, for instance in the study of ants and ant colonies. Individual ants have properties such as being able to bite me and cause pain, or pick up food and bring it back to the colony. But we would never try to transfer these traits onto the ant colony. In the same manner as we can't give an individual ant the trait of moving the colony to a new location, as this seems to happen at a collective level (Petersson 152–53). Collective actions are not simply the aggregation of all the individual actions, such as List and Pettit suggesting that a social group as a whole “votes” when the separate individual members vote (List and Pettit 159). The actions and traits of the group is different than those of its members, just as the organs in my body have actions and traits that do not transfer to the body as a whole. I can't make my heart pump or decide when a cell needs to self-destruct. And I as an individual person can move my arm, but we can't transfer the action of arm moving to the individual muscle cells. Moving my arm is an action made by my body as a whole, but not of the parts that it is made of. So I do not see why we need to use human individual traits as a starting ground when trying to identify social groups and their traits through its members, as in a bottom-up or top-down perspective. We should instead try to identify the actual traits of the social groups in-themselves, without viewing

them as part of an evolutionary ladder or tree. Two visual models that indicate an order already existing and is just waiting for the next step up or branching out. A web might be a better analogy (Kull), as it can be seen as continuous without a starting point, and more importantly no ending point, as “Human bodies and human subjects do not preexist as such; nor are they mere end products” (Barad, *Meeting the Universe Halfway* 150). This problematic visualisation often occurs in other theories such as emergentism. It is seen as building something new on top of something old, something after and something before, either as supervenient or relational (Zahle 125,128). With entities existing on different pre-existing levels. But these levels are created in our measurement, just as the entities within. An ethico-onto-epistemology model has need for a continuous possibility of non-linear development. Only when we create an objective individual entity does a linearity appear that can be followed up and down, left and right. Just as physics in general, there are no inherent directions in general metaphysics. Something that becomes especially important when discussing agency and its general proprietors.

Reading List and Pettit’s book I see almost only special cases demanding a state of idealism. In the example of members that create a groups of judges or jurors they are seen as able to make decisions without being affected by outer influence, keeping anonymity and neutrality (List and Pettit 49). Human individuals do not work in this way, we cannot turn off our intraactions with our own and other groups, as we are constantly affected by culture, family, politics, feelings, chemicals produced inside and outside our bodies, and lots more; breaking the axioms of anonymity and systematicity. The clean and proper logic used by List and Pettit indicate an impossible set of people, where if they were “competent” decisions would always be made in perfect accordance with laws and traditions (List and Pettit 98). Reality is very different, and the social group of juror are much more than just the people in it. Simply scheduling a hearing before or after a lunch break can have significant effect towards the ruling (Danziger et al.). Making the trait of being before or after lunch a member of the set of jurors, with a seemingly endless more variations to the structure of the group, all up to our choosing. In a general discussion of agency people cannot be separated from what makes them people, and the formal system that List and Pettit create to make their case falls apart as soon as it is introduced to real life situations. An individual ant colony could maybe be seen as a theoretical fair election through collective action in certain circumstances. But I would claim that there are no such things as totally fair elections within human groups. Different individuals always have different sway and influence, making the members themselves the individuals actually voting, never the grouping of them. A social group as an individual entity lack the necessary traits to enact a voting. Although a big enough social group can be seen to take actions as an entity; a *joint commitment* as described by Margaret Gilbert. These are explained as being separate from a commitment towards myself, such as the act of going for a walk on my own. Instead if my friend and I decide to go for a walk together it becomes a joint commitment between the two of us. Importantly, Gilbert states that this is not an aggregation of two individual commitments, but the creation of an entirely new joint commitment, and in turn the creation of a new plural subject that is the group of us. This way of categorising the two separate phenomena is really enticing, but unfortunately I don’t think Gilbert uses it to its full capacity, and instead falls back on the singular individualist view and outcome when discussing its consequences. Mostly as the examples throughout the book are done on very small groups, often consisting of only two or three people (Gilbert 5). Just as water molecules or cells, the number of individual people needed to make a social group is not something binary, as the traits of a social group are seemingly impossible to identify at this size. I believe the individual person’s actions and traits are

still very prominent in a group of two or three, and we can only measure the existence of new traits with sufficiently large groups. Also, a small social group can have very different properties compared to a very large social group. An interesting fact that has been shown to occur in large language models, where the larger the model becomes the greater the chance for it to develop new and unexpected traits (Wei et al.). Traits that did not exist in the smaller version of the model, even though the members were of the same kind. The creation and existence of traits such as responsibility is a continuous and iterating act, showing up in the measured individual of our choice.

Separations and measurements

Much of the recent literature on social groups have been efforts to try and create axioms for creating a set of all groups that we are interested in, and in the case of Pettit and List this would be the groups which have agency in themselves, as opposed to those that do not. Creating a complete and discrete set of agency bearers becomes paradoxical as we always need something to measure against the entity we are trying to objectively view. Gödel showed, in simple terms, through the theorems of incompleteness that it is impossible to prove a complete and discrete set to be consistent (Raatikainen). When measuring a certain group we always make a conscious decision about what group we want to analyse, with an equally important decision of those that are excluded from this perspective, while at the same time creating a third apparatus of measurement, with what Barad calls agential cuts (Barad, *Meeting the Universe Halfway* 148). When this specific measurement is made the group can be seen as making a shift to an individual entity that is part of a causal trajectory, interacting along the way with the entities that have been excluded, relating to an origin of measurement. For instance we can view the group of all humans as a dynamic and continuous group, where boundaries between ethics, cultures and biology are never clear and static. And as soon as we separate out one specific part of it with a place in space and time, we create endless more that are not part of the first, and they become individuals that constantly act on each other. In this way we don't need to find what kind of groups *actually* can count as an agential group or not, such as "left-handed Northwestern students and corporations" (Lackey, *The Epistemology of Groups* 6), in a binary manner. They are all part of the same phenomena that become objective as soon as we declare them to be. Depending on how we measure the group in question we get different results, and sometimes their agency can be identified and sometimes not (Lackey, *The Epistemology of Groups* 8). The groupings are many and never complete in themselves. Deciding who has agency or not is something that has been tried many times before, leaving out both children and women at times, and up to very recently animals. Whatever trait we want to decide on there will always be outliers to the groupings made, as normal distribution shows.

A solution to the problem of distributing agency and the possibility of responsibility is Barad's agential realism, where agency is not seen as a trait as such but instead the continuous enactments of our world (Barad, *Meeting the Universe Halfway* 141). Belonging to neither the individual nor the group, we fear not losing our atomistic individuality within the holistic group as they are both always present, endlessly performing agential cuts in complementarity.

Discussion

To properly decide on responsibility there needs to be a causal chain of actions that can be objectively identified, therefore we need individuals with their own unique place in spacetime. What the structure of this individual looks like is nothing that is possible to decide a priori, as the grouping

of members can vary in seemingly endless possibilities. So responsibility is not something an entity either has or has not, but like most things is something decided upon during the moment of measurement. For example not all humans are seen as responsible, as the case of those that are decided to be enough psychologically or physically different compared to the norm, with for instance dementia or learning disabilities, we acknowledge that they do not always have responsibility for actions made as individuals. For some though the decision is not as clear cut if they are responsible or not, such as those with the neurological differences we call ADD or autism. The areas of psychological and physical diagnosing is difficult to navigate, where the diagnosing practices have a real affect on those diagnosed (Hens 28). Just one of many areas where an awareness of our own impact of choices made can help the entangled ethical discussion, and that there are no a priori categories of things to fall back to. New materialism sees the world as non-dualistic, where all is part of the same continuous manifold. When a measurement is made we shift to a discontinuous manner of individual parts with predictable causality. The two states are complimentary, and it is not possible to be in a mix of the two. This is especially important to remember when talking about the natural or non-natural. There is no natural order to things, and we can't deviate from an order that does not exist a priori. A simple example of this is that of plastic, which has been regarded as alien and unnatural in our world. We have found that this 'new' material has been incorporated into what we normally see as the natural order, where bacteria and insects already break down and use the energy within our plastic creations. Viewing our own place in the world as something wrong or alien, seeing our products and developments as 'destroying nature', or regarding our consciousness as unique and different compared to others creates a separation and hinders the work towards a fruitful interaction with that which is around us. Judgements towards actions taken are a measured individual entity just as all others. There is no a priori right or wrong, no good or bad choices; there are only choices. Taking on the challenges presented to us by the anthropocene often sets up the problem with a pre-made separation. That of the human and non-human, or the natural and the non-natural. Knowledge and matter starts out as a continuous entangled state of being, and to find a fruitful solution for moving forward we need to remember that this is where we also should start, without any predetermined judgments or initial states of being. When we then gain knowledge along the way we add more pieces to the puzzle, creating a smoother curve of normality getting closer and closer to the continuous curve that is there. But the jagged structure of our objectivity will always persist, no matter how small the pieces become.

Notes

¹ For a brief explanation of the double slit experiment see this presentation by Jim Al-Khalili:

<https://youtu.be/A9tKncAdlHQ?si=0kSEB-NrbvhtNeay>

² For an in depth explanation see 3blue1brown videos on calculus:

<https://youtu.be/WUvTyaaNkzM?si=EF6CEQ2QZlgFv-v3>

³ Here is an excellent try though: <https://htwins.net/scale2/>

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