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Caught in the Lattice

abstract This paper connects recent philosophical discourse on ontological entanglement and materialist epistemologies, following the unfolding of the ecological crisis with the modern episteme, through the historical example of the Linnaean classification system. It suggests a comprehensive theory of grids as a relay between the concrete and the abstract, coining the term conceptual grid. For this purpose, Bernhard Siegert's media-theoretical understanding of the grid is modified.

As conceptual grids shape perception, they become widely invisible. This unnoticed pre-structuring of relations to the world is problematized in the contemporary humanities discourse on the ecological crisis. To counter the separating functions of the conceptual grid, notions such as holobiont, endosymbiosis and sympoeisis are drawn from recent observations in evolutionary biology, arguing for an entangled becoming-with.

In 2018, a spider was observed nursing its offspring — a scene more often associated with mammals, such as cats and dogs, than with spiders. The Chinese scholars who observed this phenomenon published their findings in *Science* and emphasized the extraordinary mammalian behavior of this jumping spider (Chen et al.). There have been other cases that included pigeons and cockroaches, for example, in which animals that are not classified as mammalia produce a nutritious fluid to feed their offspring. Their way of food provisioning differs from the

class of mammalia in the duration of providing milk and the associated social interactions with their offspring (Chen et al.). What is interesting about the observation of the behavior of the jumping spider is the fact that the "milk" produced by the spider resembles the milk produced by mammals, not only with regard to its nutritional composition but also regarding the behaviors that surround the procedure of nursing (Chen et al.). These findings are surprising and uncanny because they appear to fracture the persistent taxonomy and the practices of observation that depend on it.

Although the jumping spider, or Toxeus Magnus, shares a set of qualities with other animals of the class Arachnida — defined as joint-legged invertebrate animals — it differs severely from its assigned class regarding its reproductive behaviors. The nursing habits of the spider had not been observed before due to assumptions about the spider's behavior that were based on its classification into the class Arachnida, which, in turn, was based on its physical features, rather than empirical verification. This spider emerges as a monster, challenging the very logic of taxonomy itself. The notion of the Monster, as I would like to define it in this context, bears a twofold meaning. Firstly, it implies something "un-natural," meaning that it defies the normative functions of taxonomy. Secondly, and according to the way that Donna Haraway employs the term, it describes a being that merges two separated

categories and is therefore something in between (*Simians* 180). This is also what happened in the case of the Toxeus magnus, as it exists both inside the order and simultaneously outside of it. Therefore, the case of this spider is able to demonstrate the limitations of the taxonomy precisely because its reintegration into the order does not quite work.

In my view, the simultaneity of the application of order and its failure lies at the core of the emergence of monstrosity. Therefore, I would like to argue that monstrosity is actually produced by the order itself. Seen and described through the grid of the order, Toxeus magnus subverts the perpetual naturalization of the taxonomic grid by its monstrous emergence. It does not only indicate the contingency of the order but also calls attention to the in-betweens that exist alongside the established categories. In the introduction to *Arts of Living on a Damaged Planet: Monsters of the Anthropocene*, Anna Tsing et al. propose that "[m]onsters are the wonders of symbiosis and the threats of ecological disruption" (M2). In other words, symbioses of entangled species appear as mythological chimeras known for transgressing species boundaries that emerge from presupposed separations. The quote also refers to the perceived monstrosity of certain species caused solely by the disruptive actions of humans. With these propositions in mind, the case of the Toxeus magnus compels us to rethink the historically contingent order that constituted its monstrosity in the

first place. This paper explores the means and materializations of classification as a conceptual grid, departing from the paradigmatic case of the taxonomy invented and established by the Swedish biologist and botanist avant la lettre Carl Linnaeus (1707-1778). His ordering system of plants and animals is, with its modifications, adaptations, and an ongoing expansion of classified species, still in use today (Polaszek vii).

In the first section of this paper, I will provide a brief overview of the history of the creation of Linnaeus' taxonomy and examine its connections to theology and European colonialism. In the segment that follows, I will analyze the "mission" of Linnaeus' attempts to establish an inventory of "nature" and point out the effects of economic rhetoric and the relation to life forms along the lines of Martin Heidegger's notion of the GESTELL. I will then turn to Foucault's historical analysis, in which he identifies the Linnaean taxonomy as emblematic for the modern episteme, which emerges alongside a new practice of knowledge production, organization, and visualization. I will argue that the Linnaean order imposes the structure of a tabula, a conceptual grid that implies specific mechanisms of inclusion into the order. However, its scope is not limited to the classified objects, as it transforms the relation between entities. Thus, its structure also has an immense impact on our perception and ways of existing in the world. Our acts of observation are caught and

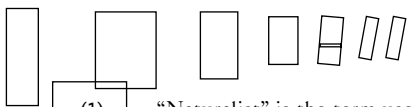
shaped by the lattice and inform the investigative gaze of scientists and knowledge communities. This section will be guided by questions concerning the characteristics and implicit functions of organizing knowledge in a conceptual grid. In conclusion, I will develop a critique of the "naturalist ontology" of which Linnaeus' taxonomy is a part. With regard to the ecological crisis, scholars such as Donna Haraway, Anna Tsing and Bruno Latour have questioned this particular way of producing, organizing, and representing knowledge in and through conceptual grids. They emphasize the interdependencies and the situatedness that constitute every life form. Their projects each offer a distinct approach to the reintroduction of the human into its wider entanglements, thereby overcoming the separation between "culture" and "nature."

Genesis of a Symbolic Arc

Born and educated in Sweden, Carl Linnaeus (1707-1778) published his ideas for a system of classification of plants and animals according to their sexual organs in what would become the first of twelve editions of *Systema Naturae* (1735). His system of classification was founded on a method of comparison, identifying similarities and differences among anatomical and reproductive features (Stach 41). It allowed the organization of entities into taxa or groups. These groups were then assigned a certain rank: domain, kingdom, phylum, class, order, family, genus, and species.

In addition to the taxonomy, Linnaeus invented a corresponding naming system that resembled the first-and-last-name system used by humans, and which has therefore been described as "more people-like" (Farber 11). The classified entities thus received the equivalent of a family name, referring to the genus, and a first name reserved only for the single species. This system, called the binomial nomenclature, consists of a combination of two Latin or Latinized terms and cannot be employed separately from the taxonomy. Thus, in order to accept the designations, Linnaeus's contemporary scholars were forced to accept his system of classification as well.

Historian of science Paul L. Farber has described how Linnaeus and his contemporary colleagues encountered newly imported species from the colonies. He notes that "[n]aturalists examined these specimens in order to document the creation and to keep better track of potentially valuable products" (Farber 8).(1) The search for economically exploitable species that could be transformed into commodities by selling them to collectors for their "curiosity cabinets" can be considered one of the reasons that classifying and



(1) "Naturalist" is the term used to refer to the scholars who were working in the broad field of what we understand today as the distinct disciplines of biology, botany, and zoology.

ordering took place (Farber 22). The other reason proposed by Farber is that the naturalists realized that nature, or "God's creation," was a lot more diverse than they expected (22). These experiences of the unknown, the exotic, or the alien sparked the motivation to integrate what was not yet integrated into the commonly accepted framework for ordering and describing natural phenomena. Linnaeus and his "apostles," as he had started calling his students, saw the ordering of the "divine creation" as Biblical, and as fulfilling "Adam's task" of giving every animal and plant a name (Blunt and Stearn 183).

It is important to note, however, that Linnaeus and his contemporaries thought of "creation" as static and complete. Thus, Linnaeus believed that the species as he observed them during his lifetime had not changed since their "Godly creation" (Farber 11), and he assumed the task of classifying to be a finite one. Only seventy years after Linnaeus's death, the dynamic genealogy of species was introduced by Charles Darwin, transforming the visual representation of taxonomy from a grid structure into the tree of evolution.

Divide et Impera!

The Linnaean INVENTORIZATION — I use the word inventorization here to emphasize the process of converting entities into elements suitable for an inventory — of "Godly creation" has manifested itself in two ways. On the one hand, the inventory has become a system to

demonstrate the extinction of numerous animal and plant species. The classification system has thus taken up an emancipatory function for organizations and activists that fight for the protection of the diversity of species. This is made possible due to the structural qualities of the grid: species assigned to a certain place in the grid cannot be found anymore because they have gone extinct. Through the empty spaces and fields we can now see the destructive effects of climate change and human activity on the earth. On the other hand, the term "inventory" employs a rhetoric of economics. In this sense, an inventory is performed to check which resources are available and in stock.

A philosophical account of the inventorization of the planet and its reduction to exploitable qualities has been provided by Martin Heidegger, who embeds it into a larger historical and epistemological configuration of Western scientific thought. Heidegger uses the term BESTAND ("standing reserve") to address how through inventorization the natural world becomes inanimate and passive, a resource that is "ready at hand" (17). This perspective on the world also turns itself against humans and includes them in the Bestand. This particular way of engaging with any possible entity is due to what Heidegger calls the GESTELL ("enframing"). It puts ("stellt") entities in an assigned place and frames them according to a technically accessible understanding (Heidgger 19). This pushes other possible modes of

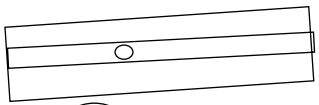
being, interdependencies, and interrelations between the entities declared as Bestand into the background. If we attempt to visualize the Gestell, it resembles a grid structure in which humans perceive the world around them as passive and ready for inventorization and exploitation. Vice versa, the Gestell helps to highlight how the Linnaean classification system can function as a grid in the sense that it has the tendency to passivize and stop the metabolic circle of life forms — to wipe out interrelations and categorize all entities under even more specified forms of control and supervision. The classification system bears specific functions concerning the production of knowledge and diagrammatic characteristics that will be examined in the following paragraphs.

Linnaeus's project of classification is exemplary of scientific development at the cradle of modernism. Michel Foucault identifies a break with the previous episteme of the "classical age." He explains how "[w]ithin a few years (around 1800), the tradition of general grammar was replaced by an essentially historical philology; natural classifications were ordered according to the analyses of comparative anatomy; and a political economy was founded whose main themes were labor and production" (Foucault xi). These newly emerging sciences

> always carry within themselves the project, […] of an exhaustive ordering of the world;

> […] and at their center they form a table on which knowledge is displayed in a system contemporary with itself. The center of knowledge, in the seventeenth and eighteenth centuries, is the table. As for the great controversies that occupied men's minds, these are accommodated quite naturally in the folds of this organization. (Foucault 82)

In this passage, Foucault connects the material table — a piece of furniture — to a conceptual table as a new way of framing and organizing knowledge. Foucault's description of this historical turning point can be positioned in opposition to Heidegger's suggestion that the Gestell had already emerged in ancient Greek society and throughout the history of the Western world. In the following passage, I will focus on a more specific inquiry into the functions and subversive presumptions of the grid as a taxonomic tool. Accordingly, I shift the focus to the researcher's table and its role in the process of transforming living beings into data to make them conform to the conceptual table, or, what I found to be a more useful term, the CONCEPTUAL GRID (Siegert 98).



(2) I apply it as a broader notion for not only the Linnaean classification system but also a certain set of specifically functioning taxonomies.

In order to define the term "conceptual grid,"[2] I will compare it to the analysis of grids in urban planning and geography developed by media theorist Bernhard Siegert. By doing so I aim to clarify the similarities and differences between them and point out the analytical surplus of the conceptual grid in the context of the Linnaean system and beyond. Although these two forms of the grid share many characteristics, they differ in one crucial aspect. Departing from Siegert's understanding of the grid, I will propose that his notion needs to be extended and modified in order to transform it into an applicable tool for the analysis of qualitatively operating systems of classification.

Siegert proposes that the grid can be described as a "cultural technique" — orders of symbolic apparatuses of differentiation, which make "the real" articulable and thus operational (Siegert 14). He adds that grids have the tendency to assert themselves as the real and can therefore become "naturalized" and, thus, invisible. Alongside the dividing and separating qualities of the grid as cultural technique, Siegert identifies three main characteristics deriving from the inquiry into representational, cartographic, topographic, and speculative grids. Firstly, the grid serves to constitute a world of objects imagined by a subject (Siegert 98). This point evokes Heidegger's notion of Gestell in that it underlines the functions of the conceptual grid concerning availability and controllability of all that is conceived through it.

Secondly, the grid serves as an imaging technology that enables the projection of "a three-dimensional world onto a two-dimensional plane" (Siegert 98). In this sense, the grid must be understood as a type of representation that presupposes a geometrical space in which objects can be located. Although Siegert refrains from making this statement, I would like to propose that this form of visual representation is the end point of processes of abstraction and reduction. Let us take up Foucault's thread again and reconsider the material aspect of the table and its function for the naturalist episteme. The physical table enabled scholars to lay out their objects of study, arrange them in order to overlook them and assign them to a certain order. The categories of the order were derived from the anatomical qualities that could then be compared to others' intrinsic characteristics. Therefore, the grid's mechanisms of dividing and separating could be understood literally with regard to what is done to the bodies of examined animals: the organism is taken apart, resulting in its death (Siegert 98). Connected to this practice is the development of preservation strategies such as taxidermy, which can be etymologically translated to "ordering of the skin." Furthermore, the removal of an animal's skin is a clear example of Siegert's argument that three-dimensional objects can be flattened onto two-dimensional surfaces. These material requirements of classification are the steps of abstraction

through which an object has to go in order to be classified into the grid-scheme. In the following paragraphs, I will take a closer look at these processes of abstraction.

By the time the animal arrives on the scholarly table, the first steps in the abstraction process have already been taken. The animal, either living or dead, is brought into the artificially constructed environment of the scientific laboratory and is thereby taken out of its former context. Through the processes of examination described above, the animal is turned into an object and thus becomes data. In the final step, the object gets assigned a "new" name and is then assigned its corresponding place in the table of the classification. Much like the physical table, however, the space of classification is conceptualized as a geometrical, Euclidean space, in which every object can be placed next to the other without taking engagements among them into account. This new idea of a space divided into columns and rows turns a three-dimensional world into a flat surface (Siegert 98). In the case of the Linnaean classification system, the process of positioning in the grid is determined and indicated by the binomial nomenclature that employs a coordinative function through genus and species. The void of each window in the grid builds the operative condition of enclosing life forms in a coordinative system and results in a specific type of perceiving the world.

The scholarly table, tightly connected to the new episteme of organizing and ordering knowledge,

necessarily also evokes the role of the scholar that stands behind the table. The entity watching over the physical table necessarily stands outside of the realm that can be translated into the two-dimensional world of the conceptual grid. Haraway proposes that this "God trick, of seeing everything from nowhere" has established a new subjectivity of the all-observing subject that takes on the "Godly" position outside of space and time ("Situated Knowledges" 581). This absolute subject thus envisions itself in a world of objects and understands itself as the only actor in a passivized "nature" through the conceptual grid (Siegert 98).

Siegert's third and final characteristic of the grid is that the grid serves as a diagrammatic procedure that uses specific addresses to store data. This can be implemented in the real as well as in the symbolic. With regard to the Linnaean taxonomy, this perception turns living beings into data by extracting certain qualities before assigning them a place in the taxonomic conceptual grid. In Siegert's example of the urban planning of colonial cities such as Lima, the assigned address refers to an actual place in the material world, a street and a house where the person resides. Conversely, in the conceptual grid of Linnaeus' classification, the address or the assigned place in the grid does not refer to a place in the real but to an artificially constructed conceptual space. I would like to propose the example of Toxeus magnus. Through processes of reduction and

abstraction, the spider is transformed into an object that can be arranged not only on top of the "table of knowledge" but also within the conceptual grid of taxonomy. As an object, it can be categorized into the class Arachnida based on certain qualitative attributes. These attributes have been singled out and thus constitute the logic of the order. Furthermore, the animal's name becomes operational in the symbolic order of the taxonomy, referring then to the classification system itself and its own intrinsic order. Arguably, what I referred to as MONSTROUS in the introduction now reveals itself as the "real" breaking into the symbolic realm of the ordering system, suddenly claiming two distinct places simultaneously. It is actually the monstrosity of symbiosis when multiple species that live across boundaries demand a single place in the conceptual grid. Held against that reality, the monstrosity of human behavior towards its living surroundings becomes apparent.

Limits of Order

As we have seen, the grid, as a medium of rationalization, demands the stripping away of most of the interrelations and dependencies in which the animal is embedded during its lifetime, and therefore underlines its independent autonomy. In order to fit into the grid, the animal is reduced to a type based on specific predefined characteristics. Rather than reducing living entities to passivized inanimate objects that can be positioned in

a Euclidean space, I would like to propose that these entities should be considered as situated in a space that has been constructed on the foundation of their intrinsic entanglements. This understanding would associate this space with having its own history, development, ephemerality, and being constituted by the living matter inhabiting it, rather than the other way around. This does not mean that everything is connected to everything in a universal sense but rather in a local one. As a critical anthropologist, Anna Tsing employs the notion of ASSEMBLAGES to describe these local entanglements of life:

> Assemblages are open-ended gatherings. They allow us to ask about communal effects without assuming them. They show us potential histories in the making. […] For living things, species identities are a place to begin, but they are not enough: ways of being are emergent effects of encounters." (16)

For Tsing, every life form is at the same time product and producer of assemblages. They build worlds through entanglements between species that are not limited by the supposed "purity" of species based on their assigned position in the conceptual grid (168). A living being always refers to the living beings around it, which cohabit in symbiosis or other ways of entanglement.

By emphasizing the relations that exist between living entities, Tsing counters the naturalist classification that produces a hierarchy from the general to the particular.

When creating his classification system, Linnaeus considered only sexual relationships and means of reproduction to be of importance for species' survival. A possible explanation for this approach is the importance of reproduction for securing a species' availability as a resource. However, this approach of "enframing" conceals the fact that life is dependent on other life in a much broader sense, as proposed by Tsing. To give an example: a single individual tree conceptually can exist on its own in the classification system. In the material world, however, a tree could never autonomously sustain itself. Recent publications on the "Wood Wide Web," for instance, stress the communication and exchange of nutrients among trees in a forest (Macfarlane 2). A vast network of fungi not only connects the tips of the roots and mediates between the trees but also extracts minerals out of the soil so that the tree can absorb them. The Linnaean order maintained the image of a single tree standing in an isolated space, and existing as a closed-off individual entity. The tabula structure, with its columns, rows, and qualitative features limited to a topographical logic, tends to support a restrictive understanding that does not allow us to perceive interactions and cross-pollinations between its cells and boxes.

The field of environmental humanities has been characterized by the critique of conceptual grids that govern the binary distinction between human and nature. Scholars such as Haraway (2016), Tsing (2015) and Latour (2017) have introduced notions such as SYMBIOSIS, SYMPOIESIS, ENDOSYMBIOSIS and HOLOBIONT — terms that, interestingly enough, originate from the field of evolutionary biology — into their critiques. The latter two terms, endosymbiosis and holobiont, were originally coined by the biologist Lynn Margulis, following her research on the mutual exchange of DNA between bacteria outside of reproduction (Margulis 2). In particular the notion of the holobiont is an attempt to reintroduce the human into its wider interspecies entanglements. It tries to capture the human being's dependencies on all sorts of bacteria inside and on the body's surface, ones that take on an important role in the health and wellbeing of the organism. What has been classified according to Linnaeus's system as Homo sapiens, is in fact a unity of various species and uncountable organisms that originate from different kingdoms. Boundaries that have been traced between species are therefore not only transgressed in behavioral aspects, as was the case with the Toxeus magnus, but also on the level of physical boundaries. Examples of these transgressions could be the horizontal DNA exchange between bacteria, or the incorporation of one organism into another, creating a long-term symbiosis,

like mitochondria in every eukaryotic cell.

Like the monstrous jumping spider, these notions, which address the entanglements between species, emerge out of the classification system — they attempt to reunite what has been separated into single individual units by the consistent application of the conceptual grid. The means and materializations of conceptual grids, such as the Linnaean taxonomy, not only prove to be insufficient to account for and think about twenty-first century planetary entangled living, but could directly endanger its future.

Conclusion

The Linnaean classification system established in the eighteenth century had a significant impact not only as being fundamental to emerging new disciplines such as botany, biology, and zoology, but also in shaping the way humans perceive and interact with the world around them. Identifying Linnaeus's project as a conceptual grid allows for a broader examination of its functions and material requirements. First of all, it works as a mechanism of abstraction in displacing and reducing living beings to certain characteristics with emphasis on reproductive behaviors, thus materially deconstructing the objects it aims to classify. Secondly, it introduces a mathematical understanding of space that enables the assignment of places in an infinitely expandable grid. Thirdly, the conceptual classification of species divides

and separates different entities that co-exist inter-dependently in the material world. These entities are reduced to certain characteristics, given a name and assigned a place in the conceptual grid, and are thereby stripped down to a conceptual object that can be assigned a place in the symbolic realm of the classification system itself. Furthermore, the system demands that a subject takes on a Godlike position that overlooks all species in order to assign an object to a specific space. However, this Godlike subject is also, like the objects of study, stripped of its context. Ultimately, the conceptual grid also has effects in the material world because it has heavily shaped our perception of and our access to nature by conceptualizing it as an exploitable resource.

With the human gaze caught in the lattice, no single species can escape the net of the conceptual grid. The ordering and assigning of places in a tabula structure results in a blindness for entanglements, interrelations, and dependencies. Thus, the conceptual grid illustrates a way of being in the world, and exemplifies one aspect of the naturalist ontology that makes it relevant, not only in contemporary scientific discourse but also in the experience of everyday life. As living beings we must remind ourselves of our dependencies on everything living around us, for Life, as shown, happens off the grid in its gaps and cracks.

biography Lena Reitschuster studied South Asian Studies and Religious Studies at Heidelberg University, Philosophy and Curatorial Practice at HfG Karlsruhe, and Media Studies at The New School in New York. Her research is located at the intersection of philosophy and biology with a focus on the conceptualization of broadscale system change in the face of ecological crisis.

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