

Understanding nature

Dilthey, Plessner and biohermeneutics

Jos de Mul

In Dilthey's *Lebensphilosophie*, anthropology and history are closely connected. As Dilthey himself states in an often quoted remark: »Was der Mensch sei, sagt nur die Geschichte«. ¹ However, for Dilthey history exclusively means *cultural* history. In order to develop a proper understanding of the historical condition of man, we should take *natural* history into account as well. After all, as a psycho-physical unity, *Homo sapiens sapiens* is the historical product of a complex interplay between both natural and cultural developments. Moreover, in the age of the life sciences, natural and cultural history seem to breach into one each other with an ever increasing tendency. Biotechnologies such as genetic modification, pathway engineering and genome transplantation transform organisms into cultural artifacts; and in the attempts to create artificial life (arguably the holy grail of synthetic biology), cultural artifacts increasingly display qualities that used to be restricted to organic life.

In the following, I will argue that Dilthey's hermeneutics, especially his analysis of the triad *Erlebnis*, *Ausdruck*, and *Verstehen*, still offers a fruitful starting point for the development of a biohermeneutics that not only deals with human understanding and interpretation of human beings, (inter)actions and artefacts, but which also includes the understanding and interpretation *of* and *by* non-human agents. However, the fact that Dilthey, in his later hermeneutical writings often makes a rather dogmatic distinction between nature and culture, at first sight seems to be a serious obstacle for the development of a Dilthey-inspired biohermeneutics. For example, Dilthey explicitly denies the possibility of a human understanding of plant life: »Bedeutung oder Wert kann etwas nicht haben, von dem es kein Verstehen gibt. Ein Baum kann niemals Bedeutung haben« (GS VII, 259). The possibility of understanding or interpretation *by* non-human agents is not even considered by Dilthey. Despite that, I will argue that

¹ Wilhelm Dilthey, *Gesammelte Schriften* (hereafter: GS), 28 vols. (Göttingen: Vandenhoeck & Ruprecht, 1914-2011), Vol. 8, 226. As to the English translation of Dilthey's terminology in the running text, I will follow the translations in R.A. Makkreel and F. Rodi (Eds.): *Wilhelm Dilthey. Selected Works*. Princeton: Princeton University Press, 1985f.

Dilthey's later hermeneutic writings do contain some clues for the development of a biohermeneutics. I will further develop these clues with the help of the biophilosophy of Plessner and with reference to some recent developments in systems biology and neuropsychology.²

First - referring to the debate on the demarcation of the *Naturwissenschaften* and *Geisteswissenschaften* that took place in Germany around 1900 – I will argue that in this debate various, non-overlapping ontological, epistemological, phenomenological, and normative dichotomies were at stake. Next, I will argue that these dichotomies preclude an adequate understanding of the distinct character of the life sciences, situated in between the natural sciences and humanities (§1). I will then show that Dilthey, despite his predominantly dichotomic approach in the demarcation debate, which is based on the distinction between outer (third-person perspective) and inner (first-person perspective) experience, on some occasions acknowledges this special status of the life sciences, which is connected with immanent purposiveness (*Zweckmäßigkeit*) of living entities (§2). Next, I will argue that the understanding of immanent purposiveness requires experience from an embodied, interactive second-person perspective (§3). In order to underpin this idea, I will refer to Plessner's analysis of the threefold corporeal dimension of human life in *Die Stufen des Organischen und der Mensch* (§4). In the final section, I will give a concise overview of the different types of intraspecies, interspecies and intra-organic interpretation and sketch the tasks that await biohermeneutics (§5).

² Helmuth Plessner developed his hermeneutical biophilosophy in *Die Stufen der Organischen und der Mensch* (1928) with explicit reference to Dilthey. Since the beginning of the nineties of last century several new attempts have been made to develop a biohermeneutics, although (hardly) without any reference to Dilthey and Plessner. As far as they connect to the German tradition in (phenomenological) hermeneutics, Heidegger and Gadamer are their main sources of inspiration. See for example S.V. Chebanov: *The Role of Hermeneutics in Biology*, in: P. Koslowski (Ed.): *Sociobiology and Bioeconomics. The Theory of Evolution in Biological and Economic Theory*, Berlin, Heidelberg, New York: Springer, 1998, pp. 141-172; A. Markoš: *Readers of the Book of Life: Contextualizing Developmental Evolutionary Biology*. New York: Oxford University Press, 2002; D. Ginev: *The constitution of biological object of inquiry from the viewpoint of hermeneutic phenomenology*. In A-T. Tymieniecka (ed.): *Analecta Husserliana XCIV* (2007), 151–163. Related and partly overlapping approaches can be found in biosemiotics, a subdiscipline (predominantly Peircean) semiotics inspired by the discovery of the genetic code, that came into being in the sixties of last century, and of which the journal *Biosemiotics* (Springer, since 2008) is one of the main platforms. For a recent overview of the present state of biohermeneutics and its relationship to biosemiotics, see the special issue "Esays in Biohermeneutics" in: *Biosemiotics*, Vol. 4, No. 2 (August 2011). In the present article I will restrict myself to an evaluative (re)construction of a Diltheyan-Plessnerian biohermeneutics. An analysis of the relationship between this biohermeneutics and the aforementioned alternative approaches will be the subject of a future publication.

1. Dichotomic demarcations and their discontents

From the late 19th and early 20th century German debates on the demarcation of the *Naturwissenschaften* and the *Geisteswissenschaften*, four different sets of dichotomic criteria can be distinguished.³ From an *ontological* point of view, the natural sciences and the humanities deal with different domains of reality. This ontological perspective on demarcation can be found, for example, in the Cartesian-Kantian tradition, in which an absolute distinction between matter (*Natur*), conceived as unthinking, extended substance, and mind or spirit (*Vernunft, Geist*), understood as unextended, thinking substance. Extending from this perspective, an equally fundamental distinction is made between the two classes of sciences that study these two essentially different substances. From an *epistemological* point of view, as we find it in the neo-Kantian tradition, the demarcation of the *Naturwissenschaften* and the *Geisteswissenschaften* is predominantly a methodological difference. Windelband, for example, distinguishes between nomothetic sciences, which aim at examining causal explanations based on the universal laws of nature, and idiographic sciences, which attempts to provide narrative descriptions of unique phenomena. In the case of Dilthey, the point of view is a *phenomenological* one. His basic distinction concerns two different types of experience: outer experience (*äussere Erfahrung*), based on the senses and discursive understanding, characterized by a third-person perspective causal explanation (*Erklären*), and inner experience (*innere Erfahrung* or *Erlebnis*), based on introspection and characterized by a first-person perspective understanding (*Verstehen*). While natural sciences solely depend on outer experience, the humanities interpret the meaning of expressions (*Ausdrücke*) of the human mind (given in outer experience) by linking them to inner experiences. These inner experiences can be conceived psychologically, as Dilthey was inclined to do in his works prior 1900, or rather concern an independent meaning (*Bedeutung*), as Dilthey argues in his later hermeneutic writings, inspired by Husserl's phenomenological analyses in the *Logische Untersuchungen* (1900/01). Like Husserl and the neo-Kantian Rickert, Dilthey also distinguishes the *Naturwissenschaften* und *Geisteswissenschaften* from a *normative* point of view. The first category of sciences are value-independent, whereas the latter has a special relation with logical, ethical, political, religious, aesthetic etc. values, either in a

³ See for a more detailed discussion of this debate: J. de Mul: *The Tragedy of Finitude. Dilthey's Hermeneutics of Life*. New Haven: Yale University Press, 2004, 189-205, 221-225.

descriptive (Rickert) or in a normative (Dilthey, Husserl) sense.

The demarcation debate that took place around 1900, which found a reprise in the *Positivismus-streit* in the 60s and 70s of the last century, strongly contributed to the dominant picture of two distinct cultures with essentially different domains, methods, and aims, represented by scientists on the one hand and literary intellectuals ('natural Luddites') on the other.⁴

This image, however, is problematic for several reasons. Although the four sets of criteria are somewhat related, they do not completely overlap. For example, within the natural sciences, there are disciplines which are primarily directed at generalization (e.g. mechanics) and disciplines which study unique phenomena (e.g. astrophysical accounts of the evolution of the universe). This also holds for the humanities: whereas historians primarily individualize, general linguists study the universal properties of language. And though one might say that mechanics is value-independent, this cannot be said for medical disciplines such as psychiatry. Moreover, causal claims are not restricted to nature, but can also be applied to the domain of the mind (for example, in behaviorism and other branches of 'scientific psychology'), just as nature might become the 'subject' of hermeneutical interpretation, as is the case in biohermeneutics.

In addition, just as humanities scholars cannot refrain from outer experience (after all, in their study they rely on material expressions of the mind, such as human acts and cultural artifacts), scientists aiming at causal explanation cannot refrain from inner experience in the sense that they have to recourse to meaningful models and metaphors when they design and interpret their research.⁵ Metaphors not only embody a specific ontology (as they are based on a mixture of source and target domains and are therefore often both ambiguous and productive), but they also bring along a 'deontology', a certain normative tenor.⁶

However, in light of my present concern, the most problematic characteristic of the dichotomic demarcation between natural sciences and humanities is that it hardly leaves any room for an important third domain of reality in between innate matter and

⁴ C.P. Snow: *The two cultures and the scientific revolution*, The Rede lecture. New York: Cambridge University Press, 1959.

⁵ Cf. K. Baake: *Metaphor and knowledge : the challenges of writing science*. Albany: State University of New York Press, 2003; M. Hesse: *The explanatory function of metaphor*. In: M. Hesse (ed.): *Revolutions and reconstructions in the philosophy of science*. Bloomington: Indiana University Press, 1980.

⁶ G. Lakoff and M. Johnson: *Metaphors we live by*. Chicago: University of Chicago Press, 1980; D. Journef, *Metaphor, Ambiguity, and Motive in Evolutionary Biology*. W.D. Hamilton and the "Gene's Point of View". In: *Written Communication* 22/4 (2005): 379-420.

the immaterial mind: the realm of 'living matter'. Evidently, the natural sciences, the neo-Darwinian life sciences in particular, have gained an impressively large body of knowledge about living matter on a molecular level. Furthermore, this knowledge has enabled them to substantially manipulate or even 'engineer' organisms. However, the »greedy reductionist«⁷ claim that drives, sensations, feelings, representations and other characteristics of life are in fact nothing but physiological processes seems to throw the baby out with the bathwater. And the hermeneutic claim, as expressed by Dilthey, that living things such as trees cannot have any meaning, and cannot be understood at all, seems to be doing exactly the same.

2. Dilthey on biological purposiveness

Since Dilthey's name seems to be inextricably tied to the dichotomic distinction between natural sciences and humanities, it is remarkable that in several passages in his writings he unexpectedly presents a tripartite division. For example, in his 1900 essay 'Die Entstehung der Hermeneutik', he states: »Es sind selbstverständlich [...] dieselben elementaren logischen Operationen, die in den Geistes- und Naturwissenschaften auftreten. Induktion, Analysis, Konstruktion, Vergleichung. Aber darum handelt es sich nun, welche besondere Form sie innerhalb des Erfahrungsgebiets der Geisteswissenschaften annehmen. Die Induktion, deren Data die sinnlichen Vorgänge sind, vollzieht sich hier wie überall auf die Grundlage eines Wissens von einem Zusammenhang. Dieser ist in den physikalisch-chemischen Wissenschaften die mathematische Kenntnis quantitativer Verhältnisse, in den biologischen Wissenschaften die Lebenszweckmäßigkeit, in den Geisteswissenschaften die Struktur der seelischen Lebendigkeit« (GS V, 334-335). Here, Dilthey points out that both the natural sciences and the humanities start from the same elementary logical operations - induction, analysis, construction, comparison- and that these operations have their ground in a preceding experience of a nexus (*Zusammenhang*), but that the nature of this nexus is different in the different types of sciences.⁸ Surprisingly, in the next sentence Dilthey

⁷ D. Dennett: *Darwin's Dangerous Idea*. Dennett, Daniel. *Evolution and the Meanings of Life*. London: The Penuin Press, 1995, 82. Greedy reductionists »in their eagerness for a bargain«, »are trying to skip whole layers or levels of theory« and in doing so, explain »too much too fast« and »too much with too little«.

⁸ In 'Erfahrung und Denken' (1892) Dilthey argues that these elementary forms of discursive thinking are not subsequently attached to the objects of perception but are inherent in the perception. They should be understood as an articulation of a nexus that is given in the experience itself. Criticizing Kant's

does not distinguish two, as one would expect, but three different types of nexus, and subsequently three types of sciences: the physical-chemical sciences, which are based on a mathematical knowledge of quantitative relations; the humanities, which are based on a hermeneutical knowledge of the structure of psychic life; as well as the biological sciences, which are based on a knowledge of a nexus of purposiveness (*Zweckmäßigkeit*).

As Rodi has noticed, this is not an entirely isolated passage, as we find several more that contain the tripartite division in the published works and the *Nachlaß*.⁹ We find, to mention just two examples, references to the »drei Systemen von generellen Wahrheiten«, which are connected with the »drei große Ordnungen von Inhalten am Wirklichen« in "Beiträge zum Studium der Individualität" (V, 272), and remarks on organic life being the intermediate stage (*Zwischenglied*) between inorganic nature and the historical world in 'Entwürfe zur Kritik der historischen Vernunft' (GS 5, 198). While Dilthey did not elaborate these scattered remarks into a systematic theory of organic life, this does not imply that he did not develop any ideas about the *Lebenszweckmäßigkeit*. They appear in the context of his descriptive psychology and hermeneutics, in which concepts like *Zweckzusammenhang* (GS 5, 207), and *Wirkungszusammenhang* (GS 7, 153) belong to the core theoretical concepts. However, Dilthey's lack of a clear distinction between the biological and the hermeneutical nexus resulted in a rather ambiguous biological-hermeneutical discourse.¹⁰ Here, two different approaches seem eligible. The first one, suggested by York and followed by Heidegger

absolute distinction between the form and the content of knowledge from a (proto)phenomenological perspective, Dilthey states: »Das Leben selber, die Lebendigkeit, hinter ich nicht zurückgehen kann, enthält Zusammenhänge, an welchem dann alles Erfahren und Denken expliziert« (GS V, 83). In the "Ideen über eine beschreibende und zergliedernde Psychology (1894), Dilthey mentions as an example the way we experience a musical melody in a series of tones: »Viel wichtiger als diese Trennung [von Stoff und Form in Kants System] sind die inneren Beziehungen, welche zwischen der Mannigfaltigkeit der Empfindungen, als dem Stoff unserer Erkenntnis, und der Form, in welcher wir diesen Stoff auffassen, überall bestehen. Wir besitzen gleichzeitige voneinander verschiedene Töne zugleich, und wir vereinigen sie im Bewußtsein, ohne daß wir ihr Auseinander in einem Nebeneinander auffassen« (GS 5, 149-150). In this context, Dilthey also speaks from »a perception of the second degree«, in which the given in lived experience itself is articulated (cf. De Mul, *The Tragedy of Finitude*, 168f.).

⁹ F. Rodi: Drei Bemerkungen zu Diltheys Aufsatz 'Die Entstehung der 'Hermeneutik' von 1900. In: *Revue internationale de philosophie* 57, no. 226 (2003): 425-437.

¹⁰ According to Rodi, this exactly is the tenor of the critique Dilthey's close friend, Count Yorck von Warttemberg, directs at Dilthey. »Vom Grafen Yorck von Warttemberg stammt das später von Heidegger berühmt gemachte Diktum von der zu wenig betonten "Differenz zwischen Ontischem und Historischem", wobei unter "Ontisch" das organische Leben zu verstehen war. Denn York bezog sich auf Diltheys Abhandlung *Beiträge zum Studium der Individualität*, wo in der Tat die Methoden der Biologie nicht in ihrem Gegensatz, sondern in ihrer Nähe zu den vergleichenden und Typen ausbildenden Methoden der Geisteswissenschaften behandelt wurden« (Rodi, *idem*, 434; the reference to Heidegger concerns the notorious passage in M. Heidegger: *Sein und Zeit*. Tübingen: Max Niemeyer, 1927, §77).

and Gadamer, is to exorcize all biological elements from hermeneutics, and in doing so, reinforcing the dichotomic distinction between natural sciences and humanities. This strategy does not only obfuscate the biological dimension that is inherent in all understanding¹¹, but – as a result - it also radically blocks the road to the development of a biohermeneutics. The second strategy would be to take Dilthey's remark on the intermediate character of organic life between inorganic nature and the historical world seriously, and take up the challenge to develop a theory of biological *Zweckmäßigkeit* that could possibly bridge the alleged gulf between the natural sciences and the humanities, without receding to either a 'greedy reductionism' or a no less 'greedy transcendence'.

As already mentioned, Dilthey – struggling with and ultimately failing at completing his hermeneutic foundation of the humanities - did not explore this 'third way' in depth, but merely restricted himself to making sporadic suggestions. However, just because he did not properly distinguish the biological and the hermeneutical, we find in his hermeneutic writings a lot of insights that are relevant for the development of a biohermeneutics. This requires that in our attempt to apply them to organic life, we respect, more radically than Dilthey was able to do, the independent characteristics of the intermediate stage between inorganic nature and the historical world. One of the concepts we could think of in this context, is Dilthey's analysis of the »subjective immanent purposiveness" (*subjektiven immanente Zweckmäßigkeit*) of psychic life in 'Ideen', which seems to elaborate on Kant's analysis of teleology in nature in *Kritik der Urteilskraft*.¹² However, unlike Kant, who regards teleological notions as sheer regulative (that is, non-constitutive) concepts, which do not so much refer to an immanent characteristic of organic life, but rather to subjective ways of interpreting biological phenomena, Dilthey's phenomenological approach points to a teleological nexus that is immanently present in organic life itself. When we attribute an inner

¹¹ As Plessner remarks pointedly, discussing Heidegger: »Existieren kann nur, wer lebt, auf welchem Niveau immer«. H. Plessner: *Der Aussagewert einer philosophischen Anthropologie*. In: *Die Frage nach der Conditio Humana. Aufsätze zur philosophischen Anthropologie*. Frankfurt: Suhrkamp, 1976, 159.

¹² This is also Rodi's line of interpretation: »Vermutlich hat er eine Art teleologische Betrachtung im Auge, wie sie Kant in der *Kritik der Urteilskraft* für die Beurteilung von Naturphänomenen formuliert hat, also den in regulativer Absicht eingeführten Zweckbegriff als ein Prinzip, die Erscheinungen der Natur "unter Regeln zu bringen, wo die Gesetze der Kausalität nach dem bloßen Mechanismen derselben nicht zulangen"« (Rodi, idem, 435). However, unlike Rodi, I will argue that in the case of organic life the subjective immanent purposiveness is more than just a regulative concept within human understanding of living nature, but refers to an purposiveness that is immanent to organic life itself.

teleology to organic life, we articulate a given.¹³ But as the argumentation in the 'Ideen', in which he opposes the *verstehende* approach of the humanities to the *erklärende* approach of the natural sciences, remains trapped in the aforementioned demarcative dichotomy, Dilthey can only conceive the teleological nexus of organic life as either – from a first-person perspective – a subjective, metaphorical projection of the psychic nexus on the organism, or – from a third-person perspective – a hypothetical objective quality, that until now lacks (sufficient) empirical confirmation.¹⁴

Fortunately, later developments in the philosophy of science and recent research in systems biology enable us to develop Dilthey's groping intuitions in a more fruitful way. Often in today's philosophy of science a triple division is made with regards to scientific explanations. Next to the deductive-nomological explanation which characterize the natural sciences and the hermeneutic or narrative understanding we find in the humanities, a functional model of explanation is ascribed to the biological sciences: »It is characteristic for an organism that it has a certain structure or organization. The organism is oriented towards the joint goal of maintenance and reproduction, and the different parts of the organism each have a function in that they contribute to the attainment of this goal. Processes which take place in parts of the organism can be explained in terms of their function in the survival or well-being of the whole organism. [...] In the organismic model of development, explanation is functional. One does not ask for the cause of a phenomenon to be explained but rather for its purpose. Phenomenon A is explained by showing that it is functional to another phenomenon B. The emergence of lungs, for instance, can be explained by noticing that lungs guarantee the intake of oxygen, which is essential for life and growth. Although it is assumed that A (lungs) lead to B (the intake of oxygen), the point of the explanation is not that B is the result of A, but that A has a specific role in regard to B, and that B makes A intelligible. Although causal relations are presupposed, a functional explanation is not

¹³ See footnote 8.

¹⁴ »Ja in der seelischen Struktur allein ist der Charakter der Zweckmäßigkeit ursprünglich gegeben, und wenn wir etwa dem Organismus oder der Welt Zweckmäßigkeit zuschreiben, so ist dieser Begriff nur aus dem inneren Erleben übertragen. Denn jede Beziehung von Teilen zu einem Ganzen erhält erst aus dem in ihr realisierten Wert den Charakter der Zweckmäßigkeit, dieser Wert aber wird nur im Gefühls- und Triebleben erfahren. Die Biologie ist vielfach von dieser subjektiven immanenten Zweckmäßigkeit zu einer objektiven übergegangen. Ihr Begriff entspringt aus der Beziehung des Trieb- und Gefühlsleben zur Erhaltung des Individuums und der Art. Diese Beziehung ist eine Hypothese, und die Arbeit, welche bis jetzt auf ihre Bewahrheitung verwandt worden ist, hat keineswegs zu einer zureichenden Bewahrheitung geführt« (GS 5, 207)

itself causal. While A is the cause of B, B is not the cause of A.«¹⁵

The very point here is that functionality cannot be explained from a sheer causal perspective. In this sense Kant, was right in saying that, from a sheer causal perspective, there will never be a biological Newton who could explain teleological phenomena such as the generation of even a single blade of grass.¹⁶ Phenomenologically speaking, in order to approach an organism, one has to take another perspective at the organism. This perspective has to take the teleological nexus into account, which characterizes the organism qua organism. This is what happens, for example, in present systems biology. After several decades in which, from a 'greedy reductionist' perspective, the emphasis in genetics was on the causal determination of the organism by the gene, in present genetic and epigenetic research the limitations of genetic determinism come to the fore and give way to a functionalist approach. Says systems biologist Dennis Noble: »Higher levels of organization, such as tissues, organs and system, constrain and order the lower levels through what we may call downward causation [...]. Viewed from the perspective of the organism, or even from that of its environment, DNA is a database from which the organism extracts the information required to make the proteins it needs in the right quantities in the right places. This form of downward causation is effected through epigenetics: chemical marking of the genome to determine which genes are used or silenced at a given time. Genes therefore don't have much chance to be selfish; they are more like the 'prisoners' of the organism. [...] Like the pipes of a huge organ (there are organs with as many pipes as there are genes in the human genome!), they are 'played' in different ways by the different cells, tissues and organs of the body to produce the 'music of life'. And when we succeed in identifying 'genetic programs' in the body, *they turn out to be the functionality itself*.«¹⁷

It is remarkable that Dilthey - just like Noble - latches unto musical metaphors when he describes the nexus of the psychic structure: »Die Erlebnisse verhalten sich wie in einem Andante einer Synfonie? Motive auftreten, sie werden entwickelt (Explikation), und das Entwickelte wird zusammengenommen (Implikation).« (GS VI, 316). However,

¹⁵ G. Widdershoven: Models of Human Development. In: A.W. van Haaften, M. Korthals and T. Wren (eds.), Philosophy of Development. Reconstructing the Foundations of Human Development and Education. Dordrecht/Boston/London: Kluwer Academic Publishers, 1997, 33-34..

¹⁶ I. Kant: Kritik Der Urteilkraft. Theorie-Werkausgabe. Bd.X. Frankfurt: Suhrkamp, 1968, B337.

¹⁷ D. Noble: Systems Biology: A New Paradigm? (Abstract). In: Systems and Synthetic Biology: Scientific and Social Implications. 9th EMBL/EMBO Joint Conference 2008, Italics JdM. Heidelberg, Germany, 2008. Cf. for a more extensive exposition: D. Noble: The Music of Life: Biology Beyond the Genome. Oxford. New York: Oxford University Press, 2006.

the question remains if such metaphors can do justice to the intrinsic qualities of organic immanent purposiveness. How should we account for this immanent purposiveness of organic life being experienced, if both the third-person perspective that characterizes the causal explanation of inanimate nature *and* the first-person perspective that characterizes the hermeneutic understanding of meaning, turn out to be inadequate? This should urge us to draw our attention to the second-person perspective.

3. The second-person perspective: between functionality and intentionality

The closest Dilthey comes to the understanding of biological *Zweckmäßigkeit* can perhaps be found in his analysis of the understanding of human action in 'Das Verstehen anderer Personen und ihrer Lebensäußerungen' (GS 7, 205-227). This analysis is relevant for my subject, because Dilthey emphasizes the fact that human action, though it does not spring from the intention to communicate, nevertheless expresses the purpose (*Zweck*) that is given in it: »Eine Handlung entspringt nicht aus der Absicht der Mitteilung. Aber nach dem Verhältnis, in dem sie zu einem Zweck steht, ist dieser in ihm gegeben« (GS 7, 206). Within the context of human understanding of the human spirit, Dilthey's analysis of action pays special attention to its 'shortcomings'. Unlike the expression of lived experience (*Erlebnisausdruck*), as we find it pre-eminently in the work of art, human action is one-sided, because it mainly expresses regular relations, and it allows no inclusive determination of the inner life from which it arose. It only allows what Dilthey calls 'elementary understanding' of 'elementary acts' such as the lifting of an object, the swing of a hammer, the cutting of wood with a saw, in short: acts which indicate the presence of certain purposes (GS 7, 207). Foreshadowing the biophilosophy of Plessner (as well as the philosophical behaviorism of Wittgenstein and Ryle¹⁸), Dilthey argues that with regards to this class of expressions we cannot distinguish between gesture and spiritual content, as they are one: »Das Grundverhältnis, auf welchem der Vorgang des elementaren Verstehen beruht, ist das

¹⁸ According to Gilbert Ryle it is a Cartesian category mistake to comprehend body and mind as two independent substances. It is because of the same category mistake »that both Idealism and Materialism are answers to an improper question. The 'reduction' of the material world to mental states and processes, as well as the 'reduction' of mental states and processes to physical states and processes, [wrongly] presupposes the legitimacy of the disjunction. 'Either there exist minds or there exist bodies (but not both)'. That would be like saying, 'Either she bought a left-hand and a right-hand glove or she bought a pair of gloves (but not both)'.« G. Ryle: *The Concept of Mind*, London: Hutchinson's University Library, 1949, 22-23. I will come back to Plessner's elaboration of this theme in the next section.

des Ausdrucks zu dem, was in ihm ausgedrückt ist. Das elementare Verstehen ist kein Schluß von einer Wirkung auf die Ursache. [...] Wie beides [the sensory expression and the spiritual content, JdM], etwa die Gebärde und der Schrecken, nicht ein Nebeneinander, sondern eine Einheit sind, ist in diesem Grundverhältnis vom Ausdruck zum Geistigen gegründet.« (GS 7, 208).

While this elementary understanding may be of limited methodological value to the humanities, it seems to be a recognizable and adequate description of our interaction with organic life. Let me give a simple example of such interspecies understanding. For many years, until it died of old age, my family and I had a German Pointer in our household, a lively dog that loved to run and play in the fields and forest near our home. Whenever I would arrive back to our house, the following scenario would occur. As soon as the dog saw me, it enthusiastically greeted me and then ran away to collect its rope toy, after which it returned and dared me to play with him. The ritual generally went as follows. The dog put the rope toy before my feet, so that I could grab it, but as soon as I tried to do so, it tried to snatch it away. When the dog succeeded, the rope toy was put before my feet again, and when I was quicker, I was supposed to throw the rope toy away, after which the dog retrieved it and the game would start anew, and would continue until either the dog or I got tired of it.

It seems to make perfect sense to say that I had an elementary understanding of what the dog wanted from me, as soon as he came to me with the rope toy in its mouth. It is clear that this understanding is of a fundamentally different kind than the understanding of the musings of the protagonist in Proust's *À la recherche du temps perdu*. In the case of the dog, understanding of his desire to play is not so much a psychological understanding of an intention or even a hermeneutic understanding of the meaning of a gesture, but rather an understanding in embodied (inter)action. I cannot ask the dog what it wants me to do or imagine what is going on in its brain, but there is no need to do so either, as the daring behavior of the dog and the to-and-fro movement between our bodies that followed makes it perfectly clear what the intention of the dog and the meaning of its behavior are. The meaning is not something behind the to-and-fro of our playful interaction, which I reconstruct in a first-person imaginative act via an analogy (I know what it is to be in a playful mood, and hence understand the behavior of the dog as being playful), neither it is the result of a third-person perspective description of a series of bodily movements of the dog, but it *is* the interaction itself. Here, the

interpretation is *in* the bodily enactment.

What characterizes this interactive experience of purposiveness phenomenologically, is that both the dog and I experience this interaction from a second-person (in the case of the dog a second-animal¹⁹) perspective.²⁰ The purpose is not a priori given or ascribed, but unfolds itself in the course of bodily action. Seen from a third-person perspective we might, a posteriori, attribute a specific *functionality* to the playful behavior, in the sense that the elementary acts together constitute a purposive whole, which has a certain function with regard to the survival or well-being of the organism (e.g. training behavior or the avoidance of boredom). Considered from a first-person perspective, I could experience my playing as an act of *intentionality*, and I might even ascribe conscious intentions to the dog and try to imagine myself in its perspective. Of course, to what extent I may succeed in doing so will largely depend on the degree of kinship. It is easier to imagine what it is like to be a playful dog than to imagine what it is like to be a playful bat, let alone a playful amoeba or tree. And, without a doubt, in any such imaginative acts we always run the risk of anthropomorphic projection. However, the point I want to make here is that in the case of my playing with the dog, the third- and first-person perspective have a derived (if not deficient) character compared to immediate experience of becoming part of the purposive to-and-fro of the interaction. An implication of this is that our understanding of animals (and extraterrestrial or artificial lifeforms, for that matter) will depend on the extent to which we can 'go along' in a common embodied praxis, be it in a peaceful cooperation as in the case of my playing with my dog or in a blood-and-guts struggle, such as in predator-prey interactions.²¹

¹⁹ A more adequate, though not common term would be 'second-entity perspective'.

²⁰ The 'second person' is the grammatical category that in linguistic communication is associated with 'you': the hearer, the one addressed. However, the concept is not restricted to speech acts but may be extended to include all elements of non-linguistic behavior in human communication and interaction which address the other. According to psychoanalyst Bonnie Litowitz, the second-person perspective is associated with a specific class of sciences: »Specifically, I argue that there are first- and third-person sciences but that what is unique about psychoanalysis is its focus on the second person. The dialogic approach places the focus on the pragmatics of communication: the speaker's intentionality, addressed to a particular "you" in a particular time and place. These particulars localize shared concepts through indexical expressions such as personal pronouns, tense and aspect markers (that indicate the time and duration of the action), and other forms of deixis.«. B. E. Litowitz: The Second Person. In: J. Am. Psychoanal Assoc. 55 (2007), 1129-1149.

²¹ In *Die Grundbegriffe der Metaphysik* (1929/1930), Martin Heidegger approaches the question how to understand animals in a similar way. First, he also questions the sufficiency of a third-person perspective approach: "»Auf welchem Wege kann und soll die Lebendigkeit des Lebenden in ihrem Wesen zugänglich werden? In welcher Weise soll uns das Leben, die Tierheit des Tieres and die Pflanzlichkeit der Pflanze zugänglich werden? Es genügt nicht, die Gestalt des Tieres, seine Glieder und dergleichen morphologisch

The importance of the second-person perspective for the understanding of hermeneutic interaction also comes to the fore in recent theoretical debates in the neurosciences. In a recent review of research into the functional role of the parieto-frontal cortex in action observation and action execution in monkeys and humans, Giacomo Rizzolatti and Corrado Sinigaglia conclude »that, although there are several mechanisms through which one can understand the behavior of other individuals, the parieto-frontal mechanism is the only one that allows an individual to understand the action of others ‘from the inside’ and gives the observer a first-person grasp of the motor goals and intentions of other individuals«²² In a critical reaction Leonhard Schilbach argues that the (otherwise balanced) review of Rizzolatti and Sinigaglia fails to make reference to the enactive account of cognition, which stresses that cognition is achieved by an animal’s active exploration of and coupling with its environment. »This seems to be most relevant, as an extension of this account to the social domain suggests that social cognition is fundamentally different when an individual is actively and directly interacting with others. In such cases, an individual adopts a ‘second-person perspective’ in which interaction with the other can be thought of as essential or even constitutive for social cognition, rather than merely observing others and relying on a ‘first- (or third-) person grasp’ of their mental states«.²³

zu beschreiben; es genügt nicht, die physiologischen Prozesse zu erforschen und daran noch irgendeine Tierpsychologie zu knüpfen, sondern bei all dem haben wir schon vorausgesetzt, daß das Tier lebt, daß ihm in gewisser Weise bei seinem Gebaren so und so ist. Wie sollen wir dahinter kommen? [...] Wie ist Lebendiges als soches [...] ursprünglich *zugänglich*?«. M. Heidegger: Die Grundbegriffe der Metaphysik. Welt – Endlichkeit – Einsamkeit. Gesamtausgabe Band 29/30. Frankfurt am Main: Vittorio Klostermann, 1983, resp. 266. Heidegger also criticizes the first-person perspective approach: »Allgemein geht es um die Frage der Möglichkeit des sichversetzens des Menschen in anders Seiendes, daß er selbst nicht ist. Sichversetzen meint dabei nicht das faktische Hineinschaffen eines seienden Menschen in das Innere eines anderen Seienden. Es meint auch kein faktisches Ersetzen des anderen Seienden, kein Sich-an-dessen-Stelle-setzen« (idem, 296). The alternative approach Heidegger explores – a “going along” (*Mitgehen*) seems to be close to the interactive second-person perspective discussed in this section: »Wenn wir die *erste Frage* stellen: Können wir uns in das Tier versetzen?, was ist uns dabei eigentlich fraglich? Nichts anderes als dieses: ob es uns gelingt, mit dem Tier mitzugehen in der Art, wie es hört und sieht, wie es seine Beute angreift und vor seinen Feinden ausweicht, wie es sein Nest baut und dergleichen. Fraglich ist uns also nicht, daß hier das Seiende, darein wir uns versetzen wollen, sich auf anders bezieht – zu Beute und Feind Zugang und damit Umgang hat. Wir setzen in dieser Frage: Können wir uns ins das Tier versetzen, als unfraglich voraus, daß *überhaupt* mit Bezug auf das Tier so etwas wie ein Mitgehen, ein *Mitgang mit dem Zugang und Umgang des Tieres in seiner Welt* möglich, nicht schlechthin sinnwidrig ist. [...] Fraglich bleibt nur das faktische Gelingen unseres Unversetzen in diese bestimmte Sphäre. Fraglich bleiben die faktisch notwendigen maßnahmen für die Verwirklichung eines solchen Sichversetzen und die faktische Grenze.« (idem, 298-9).

²² G. Rizzolatti and C. Sinigaglia: The functional role of the parieto-frontal mirror circuit: interpretations and misinterpretations. *Nature Rev. Neurosci.* 11 (2010), 264–274, 264.

²³ L. Schilbach. A second-person approach to other minds, in: *Nature Reviews Neuroscience* 11 (June 2010), 449. Cf. M. Wheeler, *Reconstructing the Cognitive World: The Next Step*. Cambridge, MA: MIT Press, 2005; V. Reddy: *How Infants Know Minds*. Cambridge: Harvard University Press, 2008; M. Wilms, et al.:

Schilbach concludes that recognizing the enactive dimension of social cognition has important implications for both the methodology of neuropsychological research into social interaction and the interpretation of the relevant data. As we will see in the next section, it has important implications for biohermeneutics as well.

4. Plessner's embodied biohermeneutics

In contrast to the natural sciences, where one deals with external objects that always remain alien to us²⁴, in the humanities, human life grasps itself: »Leben erfaßt hier Leben.« (GS 7, 136). For Dilthey, there are two ways in which this grasping takes place in everyday life. Relating to the lived experience of one's own states, we often rely on introspection (GS 7, 119). However, the scope of introspection is limited. Our conscious states are in a constant flux and are being changed by the very act of introspection. Moreover, introspection does not give access to the inner experience of other beings. However, due to the fundamental expressivity of human life, we have access to an impressive variety of expressions of lived experience, both of ourselves and of other humans. This enormous domain of human expression (reaching from speech, body language, clothes and human action to weapons, buildings, political systems and philosophical treatises) constitutes the vast world of human culture that humanities aim to understand: »Als Gegenstand der Geistes-wissenschaften entsteht sie [die Menschheit - JdM] aber nur, sofern menschliche Zustände erlebt werden, sofern sie in Lebensäußerungen zum Ausdruck gelangen und sofern diese Ausdrücke verstanden werden. [...] Eine Wissenschaft gehört nur dann den Geisteswissenschaften an, wenn ihr Gegenstand uns durch das Verhalten zugänglich wird, das im Zusammenhang von Leben, Ausdruck und Verstehen fundiert ist" (GS 7, 86-87).

According to Helmuth Plessner, who explicitly refers to Dilthey's hermeneutics in the first chapter of *Die Stufen des Organischen und der Mensch* (1928), the strength of Dilthey's hermeneutics lays in its radical immanence, in »der *erfahrungsmäßige* Sinn des Lebensbegriffs«. ²⁵ For Dilthey, life is not a metaphysical entity as it is in the 'greedy

It's in your eyes — using gaze-contingent stimuli to create truly interactive paradigms for social cognitive and affective neuroscience. *Soc. Cogn. Aff. Neurosci.* 5 (2010), 98–107; H. De Jaegher, Social understanding through direct perception? Yes, by interacting. *Conscious Cogn.* 18 (2009), 535–542.

²⁴ »Die Natur ist uns stumm« (GS I, 36)

²⁵ H. Plessner: *Die Stufen des Organischen und der Mensch*. Gesammelte Schriften 4. Frankfurt: Suhrkamp, 59.

transcendentism' of vitalists like Driesch, Bergson or Spengler, »sondern eine durch Anschauung und Intellekt und Phantasie und Einfühlungsfähigkeit erfahrbare und selbst wieder die Erfahrung ermöglichende, erzwingende Größe.«²⁶ However, in Plessner's view, Dilthey, in his analysis of the categories of life (*Lebenskategorien*), because of his dichotomic opposition of natural sciences and humanities, failed to explore radically enough the corporeal dimension of the nexus of lived experience, expression, and understanding: »Infolgedessen erzwingt der Gedanke einer Grundlegung der geisteswissenschaftliche Erfahrung die Aufrollung von Problemen, die in die sinnlich-stoffliche, körperliche Sphäre des "Lebens" hineinreichen, erzwingt also eine Philosophie der *Natur*, in ihrem weitesten und ursprünglichsten Sinn verstanden.«²⁷ Plessner himself has developed such a philosophy of nature in *Die Stufen des Organischen und der Mensch*.²⁸ The following elements of Plessner's 'Fortgang über Dilthey' are especially relevant for the topic at hand.

First, in Plessner biophilosophy, expressivity is no longer a category restricted to human life, as it was with Dilthey. Instead, it becomes - to use a pregnant formulation of Gesa Lindemann - »eine Eigenschaft lebendiger Dinge überhaupt«.²⁹ In Plessner's biophilosophy, living things distinguish themselves from innate objects, because they realize their own boundaries: »Das lebendige Ding grenzt sich gegen sein Umfeld ab und zeigt den Sachverhalt der Grenzrealisierung «.³⁰ For that reason, biological phenomena, such as metabolism and reproduction, can be understood as expressive realizations of life. Because they have a boundary, living things are characterized by a 'double aspectivity' (*Doppelaspektivität*), they have an inside and an outside.³¹ As we see in the phenomenon of metabolism, for instance, the boundary also brings about all kinds of exchanges between the inside and the outside.

A second innovation of Plessner is his distinction, with the help of the notion of positionality (*Positionalität*), of three different types of boundary realization. While

²⁶ Ibid.

²⁷ Ibid, 61.

²⁸ Just as in the case of Dilthey, Plessner's analysis is a special type of transcendental philosophy, which does not aim at the explication of *formal* categories, but of *concrete* categories of life (*Lebenskategorien*). Plessner's terminology is not fixed, he not only speaks about »eine apriorische Theorie der Organischen Wesensmerkmale« but also uses terms such as »materialapriorischen Wesenscharaktere«, »Existenzkategorien«, and »Vitalkategorien«. Ibid, resp. 158, 172, 110, 110.

²⁹ G. Lindemann: Neurale Expressivität. Auf dem Weg zur neuen Natürlichkeit. In: B. Accarino and M. Schloßberger (Eds.), *Expressivität und Stil. Helmuth Plessners Sinnes- und Ausdrucksphilosophie. Internationales Jahrbuch für Philosophische Anthropologie. Band 1*, 2008, 85-96, 86.

³⁰ Ibid.

³¹ H. Plessner, *Die Stufen des Organischen und der Mensch*, 128ff.

plants *are* their boundary realization, animals have, to a certain extent, control over their boundary realization. Animals are aware of, and can act upon their environment. On the ontic level, this ability can be described in terms of feedback mechanisms that are embodied in their (central) nervous system. Therefore, Plessner calls the positionality of animals centric: they (inter)act with their environment from their center. Human beings express this centric self-control too, but at the same time they keep a certain distance to their center. For that reason Plessner calls the human type of positionality eccentric. Because of this eccentricity, human beings, unlike animals, are not locked up in their environment (*Umwelt*), but are characterized by a certain openness to the world (*Welt*), which manifests itself in the great variety of cultural and technological expressions in the course of human history. Human beings are *artificial by nature*, because they are characterized by an ontic necessity to sublimate and symbolically transform their drives.³² In other words, the historicity of man, emphasized by Dilthey, has a biological ground: »Durch seine Expressivität ist er also ein Wesen, das selbst bei kontinuierlich sich erhaltender Intention nach immer *anderer* Verwirklichungen drängt und so eine *Geschichte* hinter sich zurückläßt. Nur in der Expressivität liegt der innere Grund für den historischen Charakter seiner Existenz.«³³

Both from the outside and from the inside, the psychophysical unity of man expresses itself in a threefold way: »Das Lebendige ist Körper, im Körper (als Innenleben oder Seele) und außer dem Körper als Blickpunkt, von dem aus es beides ist.«³⁴ »Er lebt und erlebt nicht nur, sondern er erlebt sein Erleben.«³⁵ As a result, the human world is threefold as well: man finds himself situated in an outer world (*Aussenwelt*), an inner world (*Innenwelt*), and a social-cultural world (*Mitwelt*). Although Plessner does not explicitly talk about first-, third- and second-person perspectives, the three dimensions that constitute the human world are connected with these three perspectives. While the inner world is connected to the first-person perspective, and the outer world to the third-person perspective, the social world predominantly is entwined with our second-person perspective interactions with our fellow men.

However, we should not forget that human beings are not only eccentric, but at the same time remain centric: »Der Mensch ist weltoffen. Zweifellos, daran ist nicht zu

³² Ibid, 416. Cf. H. Plessner, *Trieb und Leidenschaft*. In: *Die Frage nach der Conditio Humana*. Aufsätze zur philosophischen Anthropologie. Frankfurt: Suhrkamp, 1976, 159.

³³ Ibid, 384-385.

³⁴ H. Plessner, *Die Stufen des Organischen und der Mensch*, 365.

³⁵ Ibid, 364.

zweifeln. Aber die Offenheit ist auf eine eigentümliche Weise verschränkt in die Umweltgebundenheit bei ihm«. ³⁶ Moreover, as far as we also remain *our* body beyond self-control, we even still have a ‘vegetable’ dimension. It is because of this threefold-existence, that we are not only able to understand our fellow men, but – as I have tried to illustrate with the story about my playful dog - up to a certain extent animal life as well, and perhaps even – in a more limited sense - vegetable life. It is also due to the fact that we share certain characteristics of life with other types of living beings that it is possible to describe and analyze the vital categories of these types.

In this context, Thomas Ebke speaks about Plessner’s ‘Vital Turn’: »Whereas Kant thought that the condition of possibility that allows us to experience objects is grounded in the synthetic operations of our intellect, Plessner encourages us to trace back this condition to a vital performance that is carried out both by ourselves and by the objects we experience. If we as human beings are able to conceive of living things as living things, then this is not due to a unique cognitive performance, but to a performance we share with the very objects we are confronted with. And this performance is the performance of life in its own right—the realization of the boundary. Thus, the turn or twist conducted by Plessner is a vital turn because we have already performed the movement of life ourselves when we describe things as living things.« ³⁷

5. Concluding remarks: Hermes’ hormones

Surveying the history of hermeneutics in the modern era, we can witness an ongoing expansion. Starting as a discipline in support of theological exegesis in the seventeenth century, Schleiermacher developed it into a general methodology of all text interpretation, whereas Dilthey further expanded it to a general methodology of interpretation of cultural expressions. Moreover, in the work of Dilthey, Heidegger, and Gadamer, hermeneutics became an integral part of the phenomenological analysis of man as an interpreting being. Finally, with Plessner’s elaboration of Dilthey’s thesis of the expressivity of life, hermeneutics even widened its scope to include living matter that is not only understood as objects of hermeneutical interpretation by human beings,

³⁶ H. Plessner. *Das Problem der menschlichen Umwelt*. In: *Politik. Anthropologie. Philosophie. Aufsätze und Vorträge*. München: Wilhelm Fink Verlag, 2001, 173.

³⁷ Th. Ebke: *Life, concept and subject. Plessner’s vital turn in the light of Kant and Berson*. In: J. de Mul (ed.): *Artificial by Nature. Plessner’s Anthropology: Perspectives and Prospects*. Amsterdam: Amsterdam University Press, forthcoming.

but as interpreting beings themselves.

On the basis of this hermeneutical bio-ontology, different types of biohermeneutical understanding and interpretation can be distinguished and analyzed. Next to the traditional anthropohermeneutics, a rich variety of animal and plant hermeneutics is waiting to be explored, both within the context of intra-species and inter-species communication. And on a more basic level, we could think of intra-organic processes of interpretation, such as the interpretation by the organism of the DNA code in order to make the proteins it needs in the right quantities in the right places.³⁸

Biohermeneutics, as envisioned here, does not start in a vacuum. Since the discovery of the genetic code in the second half of the previous century, the idea has emerged that life is »matter controlled by symbols«. ³⁹ Following this idea, a number of empirical and theoretical disciplines have emerged, which investigate this symbolic dimension of nature. Whereas zoosemiotics studies intraspecies and interspecies communication, other branches of biosemiotics focus on the study of codes, signals and signs on the organic and molecular level. A Diltheyan-Plessnerian biohermeneutics might complement these emerging disciplines with a hermeneutical analysis of understanding and interpretation.

Many hermeneuticians will refuse to apply the concepts 'understanding' and 'interpretation' to organic life, stating that this could be no more than an anthropomorphic (and anthropocentric) projection. Without any doubt, this argument hits the nail on the head in case of reductionist accounts of life, in which ascriptions of human characteristics to organic phenomena (as it happens, for instance, in Richards Dawkins' *The Selfish Gene*) indeed are no more than sheer metaphors.⁴⁰ However, as (zoo)semiotic investigations convincingly show, organic life forms do show a rich variety of interpretation beyond sheer conditioning by signals. Animals not only show complex patterns of communication (via facial expression, gaze following, vocalization, bioluminescence, and olfactory and electrocommunication), but the elements of communication often have multiple distinct meanings, depending on the context and behavioral patterns. The tail wag of our German Pointer, to take up this example once more, could convey many different meanings. Other than playfulness, it could indicate excitement, anticipation, anxiety, uncertainty or submissive placation, which can be

³⁸ See the quote from Dennis Noble in section 2.

³⁹ Quoted in: M. Barbieri: *A Short History of Biosemiotics*, 223.

⁴⁰ R. Dawkins: *The Selfish Gene*. Oxford: Oxford University Press, 1976.

interpreted, not only by humans, but also by other dogs, and in some cases even by other animals in case their *Umwelts* overlap. Although their understanding does not have a semantic dimension, they express and understand intentions when they encounter each other from a second-animal perspective. Dogs are even able to interpret meta-communication, as is the case with their so-called 'play face', which signals that a subsequent aggressive signal is part of a play fight rather than a serious aggressive gesture. And even on the intra-organic level, all kinds of interpretational processes are going on, pragmatically expressing and grasping vital needs. And understood as a sheer syntactical interpretation, even the 'reading' of a DNA sequence is part of a biohermeneutical process.

It goes without saying that there are substantial differences between the interpretation of a novel by Proust, the way a dog interprets our petting behavior, and the way a hormone, as a 'molecular Hermes', conveys a message. But precisely because of this, biohermeneutics has the task, starting from the analysis of the different levels of the organic, to analyze the accompanying – semantic, pragmatic, and syntactical ways of interpretation.⁴¹

The scope of biohermeneutics is as wide as the scope of life. And it may even include artificial life forms as soon as their behavioral performance becomes indistinguishable from organic life. 'Going along' with the playful gestures of such a robot may not be that different from our playing with a dog. As far as our form of life overlaps with other natural and artificial life forms – and our recognition might even start when we witness the spontaneous reproduction of molecules in a primordial soup – we may concur in wonder with Dilthey's motto: »Leben erfaßt hier Leben.«

⁴¹ See for a more detailed hermeneutical interpretation of this 'linguistic trinity' in the context of information theory: J. de Mul: The informatization of the worldview . In: Cyberspace Odyssey: Towards a Virtual Ontology and Anthropology. Newcastle upon Tyne: Cambridge Scholars Publishing, 2010, 105-124.