

Cassirer and Goldstein on Abstraction and the Autonomy of Biology

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Abstract

This paper examines the mutual influence between Ernst Cassirer and his cousin, the neurologist Kurt Goldstein. For both Cassirer and Goldstein, views on the nature of human cognition were fundamental to their understanding of scientific knowledge, and these were informed both by philosophical theorising and empirical research on pathologies of the nervous system. Following Cassirer, and in agreement with the physicalism of the Vienna Circle, Goldstein held that the physical sciences had progressed by arriving at abstract, mathematical representations to take the place of qualitative characterisations of observable reality. In tension with physicalism, Goldstein was not sanguine about the fruitfulness of the abstractive approach in biology. He proposed that biology must adhere to its own *sui generis* methods of observation and experimentation in order to obtain knowledge of the “natures” of living organisms. I argue that there is a parallel with Cassirer’s assertion of the differences between physical and cultural sciences, underwritten by the deployment of varying *symbolic functions*. I also propose that the neurological writings of Goldstein are an important backdrop to Cassirer’s positive evaluation of abstract thought, in contrast to the pessimism regarding a worldview dominated by scientific abstractions, expressed by philosophers such as Bergson, Whitehead and Husserl.

“If the sciences are to be apprehended as a truly systematic whole, a universal problem of knowledge must be found present in all of them, but it must also be shown that in each of them this problem demands a special solution under definite particular conditions.” (Cassirer 1923/1955:168)

“The viewpoint which we have advanced does not readily enable one to master a problem. Rather, it compels one, in every individual problem, to see its foundation, to approach it as closely as possible.” (Goldstein 1934/1939: 505)

1. Introduction/Background

This paper examines the accounts of abstract thought articulated by neurologist Kurt Goldstein (1878-1965)¹ and Ernst Cassirer (1874-1945). Goldstein and Cassirer were cousins, and exerted a mutual influence on one another’s ideas. While Cassirer’s writing on the philosophy of 20th century science is largely confined to mathematical physics,² Goldstein offers a substantial philosophy of biological and medical practice, in his 1934 book *Der Aufbau des Organismus: Einführung in die Biologie unter besonderer Berücksichtigung der Erfahrungen am kranken Menschen*, published in English as *The Organism: A holistic approach to biology derived from pathological data in Man*. My focus is on the mid 1920’s to mid 1930’s, the period which saw the publication of the three volumes of the *Philosophy of Symbolic Forms*, many of Goldstein and Gelb’s neurological case studies, as well as *The Organism*. While it should not be supposed that Goldstein’s work is a philosophy of biology that Cassirer would automatically have endorsed, or that Cassirer is

¹ See Harrington (1996: chap. 5) for biography. Goldstein is most well known for his case studies with Adhémar Gelb (1887-1936) on brain damaged WW1 veterans, now considered classics of neurology (Sacks 1995). Connections between Goldstein’s work and German and French phenomenology were established by Aron Gurwitsch (1901-1973) who studied both with Husserl and Goldstein. In the *Phenomenology of Perception* Maurice Merleau-Ponty (1945/2004) wrote extensively about Gelb and Goldstein’s patient Schneider, in relation to bodily and perceptual experience.

² For exposition see Friedman (2000) and Heis (2014). Cassirer was certainly not ignorant of all the biological sciences. He read extensively on the topic of neuropathology (see Section 2). Cassirer (1950: part 2) contains a long analysis of the history of biology.

Goldstein's only philosophical influence,³ I will argue here that – in spite of the obvious differences between them, in terms of chosen profession and methodology – there are significant points of contact regarding their views on abstract thought, and that this plays a role in Goldstein's arguments for the methodological autonomy of biology.

Moreover, Goldstein and Cassirer's writings on abstraction bear interesting relations to characterisations of the crisis of scientific rationality put forward by Edmund Husserl and his followers, and by members of the Frankfurt School. For this reason, they merit careful exposition and evaluation. Though full discussion of their place in this wider conversation will have to be postponed to a future work, in this section I summarise some aspects of the backdrop to my study that are most relevant to what follows.

1.1 Cassirer: Between Heidegger and Carnap

Much recent work on Cassirer has dwelt on his position as the last major philosopher to straddle the “analytic” and “continental” traditions. In particular Michael Friedman (2000) presents Cassirer as charting a middle course between the logic-centred and physics-inspired approach of Rudolph Carnap, and the philosophy of Martin Heidegger which presented a radical challenge to that logic-based notion of objectivity.⁴ While I will question this characterisation in the end (Section 5), I pursue this theme in my presentation of Cassirer as an advocate of the objectivity of knowledge, while at the same time a critic of the idea a unified science, modelled after physics, as the framework for understanding all forms of objectivity. Notwithstanding Cassirer's professed sympathy with the outlook of the Vienna Circle,⁵ it is striking that the system of the philosophy of symbolic forms is not compatible with the physicalism that was promoted by Neurath (1931/1983) as “the philosophy of the Vienna Circle”. Physicalism, the framework for unified science, asserted

³ See the autobiographical note first published in 1959 (Goldstein 1971) and Gurwitsch (1949) on Goldstein's philosophical influences other than Cassirer.

⁴ The 1929 disputation between Heidegger and Cassirer at Davos is the focal point of Friedman's discussion. See also Gordon 2010.

⁵ “In der ‘Weltanschauung’, in dem, was ich als das Ethos der Philosophie ansehe, glaube ich keiner ‘Schule’ näher zu stehen, als dem Denken des Wiener Kreises...” (Cassirer 2011: 206, quoted in Mormann 2016:168)

that data gathering in biology and psychology must conform to a model of observation and description borrowed from physics, and that theorising in those disciplines should likewise aim at quantitative laws (Torres 2011). As I will show, Cassirer's system of multiple symbolic forms lent itself to the view that the observation of living and minded systems required sui generis methods and conceptual frameworks, on the basis of which the sciences of biology and psychology would retain their conceptual autonomy from physics.⁶

While Cassirer was allied with members of the Vienna Circle in his opposition to fascism, he differed over the best means to resist that ideology. As Skidelsky (2009, chapter 9) relates, Cassirer did not take "scientism" -- the advocacy of a narrow form of rationality, modelled on the reasoning processes employed in the exact sciences -- to be an effective response. According to Skidelsky, the logical empiricists' attempt to build a defensive wall between the *cognitive* (empirically evaluable or logically demonstrable) and the merely *expressive*⁷ did not appreciate that mythical, apparently irrational, modes of cognition can never be eradicated from human thought; they therefore failed to domesticate them by opening them up to scrutiny within a broader picture of human rationality.⁸ In the preface to the *Philosophy of Symbolic Forms vol. 2: Mythical Thought*, Cassirer (1925/1955: xvii) singles out Comte's positivism as an example of this error:

For knowledge does not master myth by banishing it from its confines.... The foe which knowledge has seemingly defeated forever crops up again in its own midst.

⁶ Here I concentrate on the autonomy of biology; see Mormann (2016) on Cassirer's rejection of Carnap's physicalist programme for psychology.

⁷ See e.g. Carnap (1932/1959) for such an attempt. Below I employ the designator "logical empiricists" to refer to the collective view of members of the Vienna Circle, e.g. as expressed in their "manifesto" (Carnap, Hahn, and Neurath 1929/1973) and in individual publications of the late 1920's and early 1930's. I admit that this papers over the differences amongst their opinions, and across changing time periods, but it is helpful for my purpose, which is to mark the broad contrast with Cassirer's philosophy.

⁸ Cassirer (1923/1955: 83) describes the habit within modern philosophy since Descartes to treat logic as "the prototype and model for every form of the human spirit." He does not mention any of his contemporaries at this point, but singles out Hegel as an exemplar of this tendency. Note also that the dichotomy of expressive versus cognitive forms of language is rejected by Cassirer (1923/1955:93): "what language designates is neither exclusively subjective nor exclusively objective; Neither the mere discharge of emotion, nor the repetition of objective sound stimuli yields the characteristic meaning and form of language." (Cf. Cassirer 1929/1957: 399).

We can characterise Cassirer, in broad strokes, as promoting a Kantian notion of objectivity whereby the realm of empirical objects is constituted by operations of the human mind. He rejects of the ‘Given’ employed in contemporary versions of empiricism and positivism. In contrast to Kant, Cassirer takes the objectivity-constituting operations to be mutable with human culture and history, even though supported by three *symbolic functions* that are our shared human endowment – the “expressive function” [*Ausdrucksfunktion*], “representation function” [*Darstellungsfunktion*], and “signification function” [*Bedeutungsfunktion*].⁹ The form of objectivity exemplified by the physical sciences is one in which the signification function is pre-eminent. In contrast, religion, arts, and the human sciences, each with their own independent modes of objectivity, cannot be understood unless the operations of the expressive and representative functions are taken into full account. Furthermore, each mode must be judged according to its own standards (Cassirer 1923/1955:91).¹⁰

While much has been written on Cassirer’s disagreements with Heidegger, I propose here to put Cassirer in dialogue with Edmund Husserl, Heidegger’s erstwhile teacher.¹¹ Like Heidegger, Husserl wrote about the threat to European civilisation posed by a scientific worldview, one that takes mathematical physics as its paradigm of rationality (Husserl 1970); but his opinions on this matter cannot be brushed off as symptoms of descent into Nazism and anti-Semitism, as many have supposed with Heidegger’s work.¹² To speak in the broadest terms, Husserl’s diagnosis of the “crisis” in the sciences is that the idealised constructions of the exact sciences have thrown a shroud (the “garb of ideas” [*Ideenkleid*]) over the primary experience of the “life-world” [*Lebenswelt*], while the naturalistic attitude fostered by the sciences leads both scientists and laymen to mistake this constructed world for a pre-given, material reality.¹³ While Carnap can be

⁹ See Section 2 for further discussion.

¹⁰ See also Krois (2010) and Friedman (2016).

¹¹ See essays in Neuber (2016) on this comparison; summarised in Bosse, Fick, and Poljansek (2015).

¹² That is not to say that the political agenda of Husserl’s *Crisis* is unproblematic (Hyder 2009: xiv)

¹³ “Something of the highest importance that occurred even as early as Galileo: the surreptitious substitution of the mathematically substructured world of idealities for the only real world, the one

seen as a vanguardist whose project was to hasten the revolution whereby the vague terms which come to us from everyday experience and language are replaced by the precise, technical ones of logic, mathematics and science (Carus 2007: 13), Husserl saw an inherent danger in such substitutions. Cassirer, I will argue, cannot be cast either as a single-minded conservative or revolutionary regarding the increasing domination of scientific modes of thought. His analysis of the relationship between the everyday perceptual world and the conceptual world of the exact sciences occupies a place of its own.

1.2 Goldstein: Towards a Humanistic Medicine

Given the way that Goldstein's career and personal biography were marked by the two world wars and intervening turmoil, one cannot consider Goldstein's thought independently of this social and political context. *The Organism* offers a holistic programme for biological research that is comparable to the theoretical biology of Jakob von Uexküll (1920/1926), and the British "organicist" biologists (Peterson 2016), in its making the question of organisation central to the scientific endeavour, and in its resistance to the assimilation of biology to physics and chemistry (Ferrario and Corsi 2013). The tradition that holistic biology breaks away from had itself been a revolutionary one – the physicalist and reductionist movement in physiology initiated in the mid-nineteenth century by the generation of Emil du Bois-Reymond and Hermann von Helmholtz and culminating in the *reflex theory* of the nervous system (Fearing 1930).¹⁴ The reflex theory proposed that all behaviour be analysed as the aggregate of simple reflexes that are perfectly reproducible under experimental conditions -- the atoms of behaviour. The demolition of the reflex theory is a

that is actually given through perception, that is ever experienced and experienceable -- our everyday life-world." Husserl (1970: 48-49), quoted in Paci (1964). See Moran (2012: 36).

¹⁴ See e.g. Harrington (1996, chap 1), Otis (2007). Though not mentioning Goldstein's contributions, Cassirer (1950:212-216) speaks positively of the "holistic" or "organicist" movement in recent biology as a beneficial synthesis of mechanism and vitalism, as an approach that ensures the independence of biology from the physical sciences, and as an instantiation of Kant's insights from the *Critique of Judgment* regarding the difference between biology and physics. This work, the fourth volume of the *Erkenntnisproblem* series, was written in Sweden after the decade under scrutiny here. It contains a long and positive discussion of von Uexküll, which is consistent with a shorter endorsement to be found in an unpublished manuscript of 1928 (Cassirer 1996: 42-43).

central task of *The Organism*, and a tenet of Goldstein's holism is precisely the assertion that human and animal behaviour is more than the sum of reflex responses (Goldstein 1934/1939: 213).

The reactionary character of Goldstein and other advocates of holistic biology and Gestalt psychology at this time is emphasised by Anne Harrington (1996) in *Re-enchanted Science*.¹⁵ Goldstein's numerous invocations of Goethe as an exemplary scientist – and not, as Helmholtz (1995) insisted, a keen observer of nature and poet – is indicative of a refusal to accept reductive physicalism as framework for biological thought. That said, there is an unresolved tension in Goldstein's writing over the status of the atomising procedures of experimental physiology that are both indispensable in exact science and treacherous as guides to the essences or “natures” of biological organisms.¹⁶

What do we mean by the term ‘nature’? It is the same question which we have encountered previously: How do we arrive at the *knowledge of this ‘nature’*? The procedure of natural science, as such, cannot yield other than isolated facts in the physical and psychological realm; as much as we may refine our methods of observation, we will *never actually get beyond statements of such piecemeal kind*. We do not at all propose to abandon this principle of natural science. But how shall it enable us to arrive at an understanding of the ‘whole’? This is not possible through the summation of these piecemeal results, these ‘parts.’ It is certainly not possible to reconstruct the behaviour in the organism *directly* from the parts. What I have explained so far about the parts is certainly not suited for such a construction. (Goldstein 1934/1939:120)

Thus the “problem of synthesis” – the reconstitution of the parts to form a whole – remains for biology as “the scientific task of the first order” (Goldstein 1934/1939:209). Goldstein's attempted solution to this problem will be the under discussion in Section 4.

¹⁵ “Reactionary” here is not meant in the political sense. Goldstein's political affiliations were socialist (Harrington 1996:164). An important lesson from Harrington is that supporters of holism in science came from across the political spectrum, even though holism came to be tainted by association with Nazism. See Galison (1990: 744) on the political motivations for the logical empiricists' rejection of holism. Cassirer himself was a Weimar liberal (Skidelsky 2009, chap. 9; Gordon 2010, chap. 6). See also Ash (1995) on the social context for the holism of Gestalt psychology.

¹⁶ Note that the very notion of inherent natures was rejected by the logical empiricists (O'Neil and Ueber 2004: sec. 2.1).

Much has been written about the debates concerning the relationship between the natural and human sciences in this period. One popular characterisation of the division between neo-Kantian schools is that the epistemological project of the “Marburg” school (Hermann Cohen, Paul Natorp, and Cassirer) is to understand knowledge formation in the model of the natural sciences, whereas the “south-west” school (Heinrich Rickert, Wilhelm Windelband, and Emil Lask) emphasises the distinctness of the human sciences.¹⁷ With the focus on physics as the definitive natural science, less has been said by historians of philosophy of science about the status of biology in this period. Harrington (1996) provides a portrait a generation of biologists in Weimar Germany who rejected the late 19th century assumption that biology is fully subject to physical and chemical laws. The work of Goldstein, and of the Gestalt psychologists (e.g. Wolfgang Köhler, Max Wertheimer, and Goldstein’s collaborator Adhémar Gelb), is part of this shift.¹⁸ One remarkable feature of *The Organism* is its positioning of medicine as *both* a natural and a human science, thus Goldstein opposes the notion of a unified science in the physicalistic mould. The introduction of the book makes a bold claim for the human being as the best model organism for biology, while towards the end it is asserted that the study of human nature does not lead “in principle beyond the sphere of life” (Goldstein 1934/1939:477).

For Husserl, the fact that humans are both subjects “for the world” and objects “in the world” is a deep puzzle, the avoidance of which has brought about a “crisis” in psychology.¹⁹ Goldstein takes care to avoid sacrificing one dimension of the human to the other. His patients appear very much in both guises, as objects for scientific research and subjects with their own drives for self-actualisations, and personal responses to their injuries, whether it be overwhelming anxiety or subtle compensations to incapacity. This depiction of human individuality and subjectivity is made possible by use of the single-case methodology employed during his research with Gelb, and the absence of statistical averaging across patients (Gelb and Goldstein 1925: 131). Goldstein also

¹⁷ See Friedman (2000), Carus (2007, chap. 2) and Gordon (2010, chap.1) on the two schools in relation to Cassirer and Heidegger. Matherne (2015) disputes the standard characterisation of the Marburg school as uninterested in cultural science.

¹⁸ See Ash (1995: 275-83) on Goldstein’s collaboration with Gelb and the Frankfurt clinic, and his complex relationship with Gestalt psychology.

¹⁹ See Moran (2012:59 and chap. 4); Feest (2012).

emphasises the mind's embodiment, whether healthy or injured – a strong point of connection with Merleau-Ponty. For instance, Goldstein describes how damage to supposedly circumscribed cognitive faculties can affect whole patterns of observable movement and alter the entire field of subjective experience, in ways not even explicable on the reformed theory of cerebral localisation espoused by Monakow (Goldstein 1934/1939:123).

In a telling passage towards the end of *The Organism*, Goldstein contrasts his organism-centred approach to biology with an instrumental one derived only from knowledge obtained from the atomistic (“analytical”) methods – ones which assume fixed, local functions in biology and the relative independence of those functions from the state of the whole organism:

Every technology means violence to nature; and even where it utilizes or exploits natural energies by direct manipulation, it is able to serve its purpose only in opposition to nature. Moreover, the aim of technology is not to render the natural energies available and instrumental, but rather to protect its products *against* their encroachments. Around its products, it builds protective walls against nature, within which walls nature does not function, but rather the knowledge that results from analytical procedure, culminating in the form of machines. Only in that way are machines, etc., able to last.

The biologist will act in this manner, only when he is not concerned with living creatures as such, as, for instance, in breeding for human purposes; or if his lack of knowledge still obscures his adequate understanding of the nature of a living creature and its appropriate environment. (Goldstein 1934/1939:500)

Here we have a hint that Goldstein's notion of the task of biology as uncovering the “natures” of living beings is bound up with an ethical concern. If physicians neglect the “natures” of their subjects, they will through ignorance or callousness find themselves acting *against* those natures, and such actions are by Goldstein's definition violent. Moreover, Goldstein argues that physiological research, like Sherrington's, which only studies animals in “mutilated” experimental conditions, and is unconcerned for their “natures”, will for that reason neglect the animal as an integrated being. Such research bypasses the central scientific task of biology, which is to understand the whole organism (Goldstein 1934/1939:90). Thus, one can infer, an ethically dubious activity (the application of violence to nature) is at the same time a theoretical inadequacy – it seems that the ethical and the theoretical are not isolatable concerns for Goldstein.

The pleas for a humanistic medicine voiced in *The Organism* are especially poignant when one considers, retrospectively, the atrocities committed by physicians during the Nazi regime. While Goldstein (1913) did publish a work on “race hygiene”, some of his most pointed criticisms in *The Organism* are directed against the assumptions of eugenics and race theories, and the deployment of science for political ends (Goldstein 1934/1939:453-461). The following passage is one of the most clear attempts to demarcate his own holistic biology from the ideological holism and scientific racism then being promoted by the Nazis:

The prototype of the organism and the ‘essential nature’ at which we are aiming in our analysis, has nothing to do with evaluations, indoctrinated by some ideology which is nothing else than the expression of a political creed and bias. All theorems, hitherto advanced to suggest inferiority or superiority, as peculiar to a particular group or entity, are based upon a misconception and abuse of what is factually holistic. (Goldstein 1934/1939:455)

1.3 The “Crisis” of Rationality

One purpose of this essay is to read Goldstein and Cassirer as occupying a distinctive position in Weimar-era debates concerning the legacy of the enlightenment, instrumental rationality, and the question of technology. The secondary literature has most often focussed on the pessimistic and fatalistic views of the Frankfurt School (Theodor Adorno, Max Horkheimer) and of the phenomenologists (Edmund Husserl, Martin Heidegger), in contrast with the pro-science rhetoric of the Vienna Circle. A common characterisation of the dispute is of one concerning the nature of human rational faculties, with its origins in Kant and undergoing elaboration during the post-Kantian generations of the 19th century. Here is one recent commentator:²⁰

Though not designed explicitly to cater to this demand, Kant’s distinction between ‘understanding [*Verstand*]’, the human rational faculty that we employ in creating and

²⁰ See also Moran (2012:144-5) and Harrington (1996:27) on Wilhelm Dilthey’s well known distinction between *Erklären* (scientific causal understanding) vs. *Verstehen* (hermeneutic interpretation) and *Beschreibung* (humanistic description). See Gordon (2010: 60) on the south-west neo-Kantian Rickert’s distinction between “nomothetic” and “idiographic” modes of explanation, proper to the natural and human sciences, respectively.

understanding science, and ‘reason [*Vernunft*]’, a broader kind of rationality that encompasses the moral, spiritual, and aesthetic (as well as *Verstand* as a subordinate part), was seized on by Romantics and Idealists and employed to portray the Enlightenment as having truncated human rationality to a merely scientific rump, and as having ignored everything of genuine human importance. (Carus 2007:10)

Neurath criticises Horkheimer precisely for attempting to position himself at “a vantage point ‘outside’ of science (which works only with ‘Verstand’) in order to be able to analyse the entire practice of science by means of ‘Vernunft’” [Neurath (1937) quoted by O’Neill and Uebel (2004: 85)]. Such positioning immediately prompts the demand to show the credentials of any such extra-scientific evaluative systems, and it is here that the putative insights acquired by the taking up of this stance are unmasked (by Neurath and his allies) as at best poetic subjectivity and at worst beguiling mysticism – as performed by Carnap (1932/1959) in his famous “elimination of metaphysics”.

An alternative way to characterise the dispute de-emphasises such notions of rational “faculties” and focuses specifically on the topic of concept formation via a kind of abstraction -- *subsumption*. This is how J. M. Bernstein accounts for Horkheimer and Adorno’s dystopianism in their *Dialectic of Enlightenment* (first published in 1947, though grounded in their earlier thought):

Subsumptive or instrumental rationality disregards the intrinsic properties of things, those properties that give each thing its sensuous, social and historical particularity, for the sake of the goals and purposes of the subject Thus, such a rationality must treat unlike (unequal) things as like (equal), and subsume objects under (the unreflective drives of) subjects. Subsumption, then, is domination in the conceptual realm. The purpose of subsumption is to allow for conceptual and technical mastery. (Bernstein 1991: 5)

It is significant that this concern about the perils of the reliance in modern Western civilisation on an abstract and conceptual mode of thought, with the consequent separation of humanity from the rest of life, was a prominent voice in the 1920’s during the period that Cassirer was writing the *Philosophy of Symbolic Forms*. In a manuscript of 1928, Cassirer quotes a passage from Klages’ 1922 book *Vom kosmogonischen Eros*, on – to borrow Bernstein’s phrase – the very subject of “domination in the conceptual realm”:

While every non-human creature, although in itself unique and with its own inner life, pulses in the rhythm of cosmic life, man has separated from this the law of mind. What for it, as the underpinning of ego-consciousness, seems to be the superiority of predicative, calculative thought over the world, to the metaphysician, if he enters into it deeply enough, appears in the light of the subjugation of life under the yoke of concepts! (Klages quoted in Cassirer 1996:24)

Below I offer an exposition of Cassirer's extensive criticism of the empiricist theory of concept formation via subsumption, and discuss Cassirer's positive proposals in relation to Goldstein's research on deficits in "categorical behaviour" in his patients. Cassirer makes numerous allusions to recent critics of abstract thought, such as Henri Bergson, George Simmel, and Ludwig Klages who are often referred to collectively as "philosophers of life". Cassirer's alternative evaluation of abstraction is, arguably, an attempt to alleviate concerns about the negative consequences of the technological civilisation brought about through the advances of scientific abstraction.

Various scholars have written about the importance of Cassirer's engagement with Philosophy of Life [*Lebensphilosophie*] – the constellation of early 20th century philosophical output that saw a fundamental tension between the human intellect and its abstractions, and the ineffable flow of life, often characterising the *Philosophy of Symbolic Forms* as a defence of Enlightenment heritage against the irrationalism of *Lebensphilosophie*.²¹ Cassirer's positive evaluation of abstract thought is continuous with his sustained attempt to provide a more flattering picture of human rationality than the disturbing portrait that was gaining influence in the Weimar world of ideas. It is easy to find indications that the struggle with *Lebensphilosophie* is at the heart of Cassirer's conception of symbolic form. For instance, there is the Nietzschean threat in the background of many discussions of the alleged opposition between mind and life, that the highest achievements of the intellect are nothing but an intense manifestation of human will to power. In an unpublished conclusion to volume three of the *Philosophy of Symbolic Forms*, Cassirer presents his work precisely as an alternative to this "nightmare" scenario:

The philosophy of symbolic forms has sought from the beginning to establish the path that leads through the concrete productions of geist. By taking this path, the philosophy of

²¹ See Krois and Verene (1996); Skidelsky (2009: chapter 7); Skidelsky (2003); Gordon (2010: chapter 3).

symbolic forms finds that it meets with geist everywhere as not the ‘Will to Power,’ but as the ‘Will to Formation.’ (Cassirer 1996: 28)

Cassirer’s conception of philosophy is unmistakably a contrast to Bergson (1907/1944: 401) with his urging of philosophers to make a “clean sweep of everything that is only an imaginative symbol.”²² Cassirer seemed to think Bergson’s recommendation of a metaphysics of intuition to be simply impossible to follow for one, “cannot attempt to drive the intellect beyond itself by means of a decree of the will” (Cassirer 1996: 49). Yet Cassirer, in an essay on Scheler and the Mind/Life [*Geist/Leben*] dualism, offers more than an insistence on the primacy of discursive thought, and a dismissal of its doubters as muddle-headed mystics; for he sees in the very ability of the intellect to criticise itself, as manifested in *Lebensphilosophie*, the most grand quality of the intellect itself:

all those who, in the name of Life, bring the Idea into court, remain,—to use Hegel’s expression—the ‘agents of the Idea,’ for just this passing of judgment upon itself is nothing but a primeval phenomenon and imperative, a categorical demand of Spirit; and from this setting of the problem it necessarily follows that precisely the Spirit’s own accusers must in the end become its custodians and its witnesses. (Cassirer 1930/1949: 877)

We will see that Goldstein and Cassirer walk a fine line. Unlike the logical empiricists, they are sensitive to the problem that a scientific worldview in which the most refined methods of knowledge formation abstract away from the dimensions of experience that have human significance -- such as the aesthetic and ethical -- is alienating to many; but they also perceive the danger in any retreat to irrationality. This atypical combination of views cannot be weighed independently of a political context in which irrationalism came to be synthesised with anti-Semitism. Because of their Jewish origins, Cassirer and Goldstein were forced to abandon their prestigious university chairs in 1933. They both left Germany immediately and during exile in the USA they returned to the topic of human life and mind, with Cassirer producing the book *Essay on Man* and Goldstein publishing his William James Lectures as *Human Nature*.²³ By giving a

²² This conception of the task of philosophy is evaluated by Cassirer (1929/1957: 36; 1996: 47).

²³ This book begins with a stronger statement of concern about the modern world inaugurated with the scientific achievements of the nineteenth century than we see in *The Organism*. There

detailed exposition of their accounts of abstraction, one purpose of this essay is to show how this path of moderation between two enthusiasms – the anti-rationalistic utopianism of fascism²⁴ and the technocratic utopianism of many on the political left – was attempted. In Section 2 (“Symbolic Consciousness and its Pathology”) I discuss the ways in which Cassirer drew inspiration from Goldstein’s case studies in his discussion of rationality and abstract thought. In Section 3 (“Evaluating Abstraction”) I examine Cassirer’s arguments against the theory of abstract concept formation associated with the empiricist tradition and outline his positive proposal. This is followed by a discussion of Goldstein’s criticisms of the use of abstractive methods in the biological sciences. In Section 4 I present a comparison of Goldstein and Cassirer’s common case for the autonomy of non-physical sciences, with a preliminary discussion of a question left unresolved in this current study, over the direction of influence between Cassirer and Goldstein.

2. Symbolic Consciousness and its Pathology

A notable feature of Cassirer’s thought is his replacement of organising terms for cognitive faculties, such as “reason” and “understanding”, with the notion of “symbolic functions”. Moreover, our sensory capacities are not fundamentally distinct from our cognitive or conceptual ones. Instead, the states of sensory experience are inherently meaningful and are connected to concepts and systems of symbolism in different ways, according to different kinds of symbolic functions. When our experience is governed primarily by the “expressive function” [*Ausdrucksfunktion*], our perception and thoughts are bound up with affectivity. Natural language is the paradigm for the mode of operation of the “representation function” [*Darstellungsfunktion*], where one thing (e.g. a word, sentence, chart) stands as a conventional sign for something else. Cassirer (1929/1957:281) characterises the expressive function as underlying the capacity to know

are, he writes, “fatal consequences of the scientific approach to human living” (Goldstein 1940: 4).

²⁴ It is evident in his later writings on political philosophy that Cassirer did not take the anti-rationalist rhetoric of the Nazi party at face value, emphasising that the state itself, especially its propaganda machinery, was operated with great instrumental efficiency (Cassirer 1946: 282-84).

subjects and the representative function as yielding knowledge of ordinary objects in perception.²⁵ The “signification function” [*Bedeutungsfunktion*] underlies the human capacity to take things (e.g. numerals, letters, graphs) as symbols for the entirely abstract relations of mathematics and logic.

Volume three of the *Philosophy of Symbolic Forms* is designated a “Phenomenology of Knowledge” in the Hegelian sense (Cassirer 1929/1957:xiv) of a story of human thought’s coming into a fully realised state, as it evolves from systems of (culturally embedded) symbols that are most indicative of the expressive function, to a predominance of the representation function, and finally with the development of modern physics to the actualization of purely significatory systems of thought. This evolution is marked by a progressive loss, in the newer symbolic forms, of qualitative, sensory points of reference and a distillation into a purely quantitative and non-sensory system of meaning. As Cassirer (1929/1957:20) summarises his view, in contrast to an empiricist account of the meaning or scientific concepts:

The basic concepts of natural science no longer appear as mere copies and reproductions of immediate material data; rather, they are represented as constructive projects of physical thinking—and the only condition of their theoretical validity and significance is that their logical consequences must always accord with the observable data.

Cassirer does frequently make the claim – which by current lights is denigratory and chauvinistic – that the expressive function has an over-sized role in the symbolic forms and hence culture of “primitive” peoples whose world view is “mythical” rather than scientific, while the signification function is only dimly operative in such conditions.²⁶ However, it is crucial to his system that the three symbolic functions are universal dimensions of the *healthy* human mind. In order to buttress this claim, in Chapter 6 of *Philosophy of Symbolic Forms* vol. 3 Cassirer presents a long review of the neuropsychological literature on the effects of brain damage, discussing not only the case studies of Gelb and Goldstein but also the work of British neurologists John Hughlings Jackson

²⁵ Section 3 contains further discussion of the expressive function. See Matherne (2014: 127-8) has a helpful summary of the three functions.

²⁶ See Moran (2011) for a rich discussion of contemporary ideas about the “primitive” mindset, with a focus on Husserl. Both Husserl and Cassirer were influenced by the French anthropologist Lucien Lévy-Bruhl.

and Henry Head (whose interpretations he endorses) and Broca and Wernicke (whose claims for cerebral localisation he disputes), amongst numerous other researchers.²⁷

Cassirer's assertion is that the symptoms shown by patients with lesions to the cerebral cortex are manifestations of various degrees of damage to the "symbolic consciousness", resulting in the inability to "schematise", which is to integrate sensory with abstract, intellectual orderings (1929/1957:272), use the imagination (i.e. "to interchange present and nonpresent, the real and the possible", 1929/1957:271),²⁸ and to have concepts operative within perceptual experience (1929/1957:286). For example, Cassirer (1929/1957:223-232) discusses the disorder "colour name amnesia" [*Farbennamenamnesie*], which was reported in a paper by Gelb and Goldstein (1925). The patient Th. was unable to use the most ordinary colour names ("red", "yellow", "white"), or to sort objects according to the classifications designated by such names. Th. did not have any colour blindness or deficiency indicating impaired ability to perceive colour. In fact, as Gelb and Goldstein, emphasised, their patient was able to recall and label the very specific colours of things (e.g. "blood red", "colour of violets"). Gelb and Goldstein's interpretation of the disorder employs a distinction between the *categorical* and *concrete* attitude or behaviour [*kategoriales / konkretes Verhalten*] (Gelb and Goldstein 1925:152-3). The use of generic colour names depends on the ability to group objects according to abstract classes, such as "green," which encompass members that differ amongst themselves (e.g. green of grass vs. green of apples). This is only possible by taking the categorical attitude, and the capacity is lost in the case of colour name amnesia. Patient Th. can only respond to colour stimuli with a concrete attitude, one which takes each coloured item as a sensory particular and not as belonging to any abstract order of "green items." This, and other findings of his and Gelb's research of the 1920's is summarised in the first chapter of *The Organism*, where he employs the concrete/categorical distinction to account for impairments observed across a range of neuropsychological cases which, he argues, are symptomatic of the loss of various facets of categorical behaviour.

²⁷ Cassirer visited Goldstein's clinic in Frankfurt (Métraux 1999) and the two were regular correspondents during the 1920's (Harrington 1996:148-9). See Matherne (2014) for comparison of Cassirer's and Merleau-Ponty's studies of neuropathology, and Andersch (2015) on Cassirer's engagement with various neurologists and psychiatrists.

²⁸ Cf. Goldstein (1934/1939:30): "The patient has lost the capacity to deal with *that which is not real – with the possible*"

Goldstein maintains that voluntary behaviour is made possible by the categorical attitude, which is the ability to imagine non-concrete possibilities or to perceive the concrete in terms of an ideal ordering. For instance, Goldstein (1934/1939:486) observes that in contrast to the human being, the animal seems “to be far more bound to the outer world; it lacks freedom and possibility to set itself off from world.” Similarly, the behaviour of his patients is more rigid and less spontaneous (Goldstein 1934/1939:42), an observation highlighted by Cassirer (1929/1957:271-2). Thus the categorical attitude is required for the behaviours that are most characteristically human (Goldstein 1934/1939:33). There is an important contrast here with Ludwig Klages, who characterised the conceptual and abstract intellect as working to imprison the vital energy of the human body, a view which Goldstein devotes the eleventh chapter of *The Organism* to attacking. Klages features heavily in Cassirer’s presentation of the expressive function (1929/1957, pt I: chaps. 2 and 3) and Cassirer’s response to Klages is apparently more sympathetic than Goldstein’s.²⁹ In sum, both Cassirer and Goldstein take the human capacity for processes of thought which abstract away from the concrete environment, and branch out into imaginary or infinite orders of symbolism, as the most characteristic manifestation of the human life form.

This picture of the human as the symbolic animal provides Cassirer with a response to life philosophers who would object to the philosophy of symbolic forms as a shrinking away from the true, vital nature of human existence into a realm of anaemic intellectualism. Rather, he asserts, symbolic formation stands in organic continuity with what is deemed vital and non-intellectual: symbolism is the way that human life comes to fruition. Cassirer (1996: 19) makes the point as follows:

²⁹ See Harrington 1996, 154-5. Goldstein also stands in contrast to the French psychiatrist Eugene Minkowski (1885–1972) who associated psychopathology with an excess of abstract thinking and loss of contact with vital energy. Minkowski was most influenced by Bergson rather than the German life philosophers (Urfer 2002). See Gordon (2010:119-122) on Cassirer’s response to Scheler and Skidelsky (2009: chapter 7) on Cassirer’s attempt to domesticate the insights of *Lebensphilosophie*.

the ‘turn to the idea’ cannot be described as life bidding itself farewell in order to go forth into something foreign and distant from itself; rather, life must be seen as returning to itself, it ‘comes to itself’ in the medium of the symbolic forms.³⁰

Similarly, Goldstein builds a case that Max Scheler and Klages arrive at a flawed view of human nature because of their presumption of an antagonism between life and mind – an error, it is claimed, that stems from atomistic biology, and its fixation on certain capacities, vital or intellectual, in isolation from the whole organism (Goldstein 1934/1939: 466-8). In this chapter of *The Organism* Goldstein quotes liberally from Cassirer’s essay “Geist und Leben in der Philosophie der Gegenwart” (Cassirer 1930/1949), though not without critical remarks to the effect, firstly, that Cassirer has not consistently upheld his opposition to the dualism of mind and life, and his own insight that life is something more than a non-intellectual “blind urge”, and secondly that Cassirer accepts the reflex theory of animal behaviour, assuming this to be a “vital sphere” shared between humans and animals (Goldstein 1934/1939: 473).

3. Evaluating Abstraction

It is central to Cassirer’s philosophy that an inherent disposition of the human mind underlies its capacity to generate and utilize symbolic forms, even ones of the most novel and arcane sort, such as the symbols of mathematical physics. He writes in the preface to *Philosophy of Symbolic Forms* vol. 3 that, “there are formative factors of a truly theoretical kind which govern the shaping not only of the scientific world view but also of the natural world view implicit in perception and intuition” (Cassirer 1929/1957:xiii). Cassirer and Goldstein’s view of symbolic, categorical thought as the basis of the distinctively human activities – art, religion, language, and science – offers a platform for a more positive account of the role of abstract conceptual thought in a modern world ordered by scientific knowledge, in contrast to the negative evaluation associated with the phenomenologists and with the Frankfurt school, who feared a degeneration into blind

³⁰ Cf. Cassirer (1923/1955:114), “the negation of the symbolic forms would not help us to apprehend the essence of life; it would rather destroy the spiritual form with which for us this essence proves to be bound up.”

instrumental domination. In this section I further analyse the reasoning behind Cassirer's positive evaluation of abstraction.

I note at the outset that Cassirer does not assimilate the scientific world view into the natural world view of common sense, acknowledging that scientific concepts have peculiar characteristics: they are divorced from affectivity and have been progressively stripped of reference points in the sensory world of ordinary objects; instead they make contact with the pure, relational orders of mathematics and physics; they are quantitative rather than qualitative; as such they are perfectly abstract. As Cassirer (1929/1957:284) describes,

there develops a kind of detachment, of abstraction that was unknown to perception and intuition. Knowledge releases the pure relations from their involvement with the concrete and individually determined reality of things, in order to represent them purely as such in the universality of their form, in their relational character.³¹

The highly abstract nature of the scientific world picture is what rendered it problematic in the eyes of a number of contemporary philosophers, including Bergson, Husserl and Whitehead. I now suggest that Cassirer's rejection of the traditional, subsumptive account of abstraction – where abstract concepts are formed by removal of sensory particulars – while first developed in his book *Substanzbegriff und Funktionsbegriff* (Cassirer 1910/1923), are later employed as a means to alleviate these concerns. To the extent that pessimism about the future of modern life governed by abstract thought presupposes the subsumptive account, Cassirer's replacement of it with the notion of *abstraction as functionalisation* (Section 3.2), opens one door to optimism.

3.1 Abstraction as Loss

The claim that scientific thought is singled out by its high degree of abstraction was common at the time. For example, in the highly influential lectures *Science and the Modern World* (first published in 1926), A. N. Whitehead writes,

³¹ But see also Cassirer (1996: chapter 1) where the emphasis again is on the unity of the different symbolic forms *qua* manifestations of the human intellect, and their interconnection with one another.

The seventeenth century had finally produced a scheme of scientific thought framed by mathematicians, for the use of mathematicians. The great characteristic of the mathematical mind is its capacity for dealing with abstractions; and for eliciting from them clear-cut demonstrative trains of reasoning, entirely satisfactory so long as it is those abstractions which you want to think about. The enormous success of the scientific abstractions, yielding on the one hand *matter* with its *simple location* in space and time, on the other hand *mind*, perceiving, suffering, reasoning, but not interfering, has foisted on to philosophy the task of accepting them as the most concrete rendering of fact. (Whitehead 1938: 71)³²

This is what leads to “fallacy of misplaced concreteness” (Whitehead 1938:72), the error, also characterised by Husserl (Moran 2012: 96-7), of substituting the rarefied descriptions of mathematical physics for the vivid, colourful -- and indeterminate -- world of ordinary experience.³³

Lorraine Daston (2017: 137) observes that there is mood of elegy and nostalgia that hangs over much of the history and philosophy of science of this period – the progress of science is proportional to the loss of our sense of belonging in the world, and our life in this world as having any inherent meaning. In Whitehead (1938) the fallacy of misplaced concreteness leads inexorably to an undermining of the ontological status of sensory qualities such as colours and odours, as well as a stripping away of ethical and aesthetic value from human experience. Cassirer treats this view with some sympathy, putting eloquently in his own words a Bergsonian point:

physics diverts us from genuine reality, *mechanizes* this reality, separates us from *durée réelle*, from the view of ‘true being’ which is found in the I, *prior* to all objectification. (1996: 211)

But Cassirer’s response is that there is not actually a problem here. While there appears to be a clash of everyday and scientific ontologies, the incompatibility simply does not arise for his critical philosophy because it rejects the substance metaphysics which gives rise to the ontological conflict (Cassirer 1929/1957:321, 440)

³²Whitehead (1938:66) credits Henri Bergson as a forerunner to his own view.

³³ See Toscano (2008) for discussion of the fallacy of misplaced concreteness and Paci (1961) on the similarities between Whitehead and Husserl on the topic of abstraction in science.

It seems not coincidental that the dominant theory of abstract concept formation is one that involves loss. This is the idea, dominant in the British empiricist tradition that when, via selective attention, commonalities are observed amongst sensory particulars, this yields an abstract concept which selectively incorporates the common property while all of the details that distinguish the particulars are filtered out. I will refer to this as *subsumption*, but use the terms *abstraction* and *abstract* in the more general sense of a representation or concept that is relatively detached from sensory particulars. Cassirer devotes many pages of the *Philosophy of Symbolic Forms* vol. 3 to the refutation of subsumption.³⁴ It is said to involve a vicious circularity (Cassirer 1929/1957:160) and the association between concepts and “classes” entailed by this view is reported to have been undermined by recent advances in logic. Thus Cassirer rejects the notion of abstract concepts that was later targeted by Horkheimer and Adorno – in a line of criticism continuous with the *Lebensphilosophie* of the 1920’s – as the *modus operandi* of instrumental domination.³⁵ It is interesting that when Cassirer here gives voice to the critic of conceptual thought, he does not only call upon contemporaries such as Bergson and Whitehead, but frequently attributes these criticisms to Berkeley. Early in the text, Cassirer (1929/1957: 36) has Bergson voice the following view:

It is only when we succeed in forgetting everything that is merely symbolic, only when we tear ourselves away from the language of words and the language of spatial images and analogies, that true reality touches us. The dividing lines which the symbolism of language and the abstract concept introduces into reality may seem necessary and inevitable: however, they are necessary not from the standpoint of pure knowledge but only from the standpoint of action. Man can act upon the world only by breaking it into pieces—by dissecting it into separate spheres of action and objects of action.

Thus Cassirer emphasises the tight association in Bergson’s philosophy between conceptual thought and the merely instrumental (Bergson 1941). In a similar vein, Cassirer attributes the following opinions to Berkeley:

³⁴ Note that Gelb and Goldstein (1925:153) do seem to presuppose subsumption in discussion of the case of colour name amnesia:

Unsere Darlegungen stehen im Zusammenhang mit dem Problem der sogenannten isolierenden Abstraktion, d.h. dem Problem der isolierenden Beachtung einer der verschiedenen Seiten oder Momente an einem Sinneseindruck. Man könnte so auch sagen, die Kranken verhielten sich in bezug auf die isolierende Abstraktion nicht normal.

That is, “isolating attention” plays a role in pulling out the similarities from given experience.

³⁵ E.g. Horkheimer and Adorno (2002: 11); see also Bernstein (1991:5, quoted above).

concepts taken all together are not roads to reality, to the truth and essence of things, but roads away from it; they do not sharpen the mind but blunt it to the single true reality that is given us in immediate perceptions. (Cassirer 1929/1957:290)

Abstraction is rejected, because the more we rely on it, the more it threatens to confine us to the merely instrumental. (Cassirer 1929/1957:23)

These are not views that Cassirer himself endorses, but he does credit Berkeley with striking a blow to the heart of subsumption and the venerable “connection between the concept and the general idea” (Cassirer 1929/1957:290). This prepares the way for Cassirer’s positive account of concept formation, which was also first formulated in *Substanzbegriff und Funktionsbegriff*.

3.2 *Abstraction as Functionalisation*

Cassirer invites us to consider Berkeley’s famous case of the abstract idea of the triangle:

The general idea, the image of a triangle that is not right-angled, acute-angled, or obtuse-angled but is all these at once, is an empty fiction. Yet in combating this fiction Berkeley, contrary to his own basic purpose, prepared the way for another and deeper view of the concept. For he, too, with all his opposition to the general idea, leaves the universality in the form of the representative function intact. A single concrete, intuitive image, a triangle with a definite magnitude of sides and angles, can despite its concrete character stand for all other triangles, can represent them for the geometrician. Thus from the intuitive idea of a triangle there arises its concept—and *this does not mean that we simply obliterate certain determinations that are contained in it but that we posit them as variable*. (Cassirer 1929/1957:291; emphasis added)

There is much that could be written about this passage. I will highlight two things. Firstly, Cassirer employs his notion of the representative function to describe how a particular triangle can be used as a conventional sign for all triangles. But this does not lead to the universal concept of the triangle. What is needed for this is to take the characteristics of a concrete triangle – its angles and lengths of sides – not as particularities to be thrown out (lost) as the individual is subsumed into the general, but as determinations of the variables which can be adjusted to characterise any other set of values, and hence describe any other particular triangle. My second point here is that this

proposal is in line with a central theme of Cassirer's philosophy of science since *Substanzbegriff und Funktionsbegriff*, which is that scientific thought can only be refined and explicated as a progression is made away from understanding its terms as representing material substances and towards a purely relational or "functional" view.³⁶ The unity of the concept of is not grounded in the sameness of the properties of the objects it applies to, but in the rule or function used to characterise the concept and determine instances of its application.³⁷ For this reason, the true character of the concept is shown most clearly in the concepts of mathematics.³⁸

In contrast to the empiricist notion of concepts as being derived, somewhat mechanically and in a bottom up fashion, from "given" experience, Cassirer (1929/1957:289) asserts the "freedom and spontaneity" of conceptual thinking.³⁹ As he explains, "the concept is far less abstractive than prospective; it not only fixes what is already known, establishing general outlines, but also maintains a persistent outlook for new and unknown connections" (Cassirer 1929/1957:306). Thus the "downside" of abstract conceptual thinking is not, for Cassirer, the loss or "obliteration" that occurs in the empiricist picture, but that abstract conceptual thought must take flight from intuitive reality into an ideal domain that is remote from the familiar one of concrete actuality:

the concept cannot effect an ideal determination of the real as long as it remains exclusively within the confines of this reality. Its peculiar and supreme achievement requires that it progress from the contemplation of the real to that of the possible—and this it cannot do if it shrinks back from its opposite, the 'impossible.' (Cassirer 1929/1957:305)

The result is that there opens up a distance between the everyday ("natural") world of perception and the world described by the exact ("theoretical") sciences:

³⁶See Heis (2014) for recent commentary.

³⁷ E.g. "Once relation has thus been recognized as the basic and essential factor in mathematical concepts and concepts in general, the attempt to explain the content of a concept by its extension becomes untenable." (Cassirer 1929/1957:293-4)

³⁸ "The concept seems to stand out with full clarity only in its exact mathematical formulation: here an only here do we seem to find, written in bold letters, what it is, signifies, and achieves." (Cassirer 1929/1957:296)

³⁹ See also Skidelsky (2009: chapter 6). Gordon (2010) argues that Cassirer's philosophy of "spontaneity" is the key point of difference with Heidegger's philosophy of "thrownness".

theory can achieve the desired closeness to reality only by placing a certain distance between itself and reality, by learning more and more to look away from it. It is through this characteristic relegation to a distance that the *configurations* within which the natural world view dwells and through which it gains its formation are transformed into strict theoretical *concepts*. (emphasis original; Cassirer 1929/1957:283)

In his descriptions of this metaphorical separation – invoking narrative tropes of renunciation and exile – that Cassirer’s writing expresses the melancholy noted by Daston (2017) in other historians and philosophers of science in this period. For example, he writes that, “[s]cientific knowledge ... gains approximation to nature only by learning to renounce it, by moving the given into an ideal distance” (Cassirer 1929/1957:413), and that thought “must detach itself from the native soil not only of intuition but also of language” (Cassirer 1929/1957:341).⁴⁰

Mitigating these negative reactions to the new way of relating to the natural world made possible through the abstract concepts of science, Cassirer advances a number of more positive claims. Firstly, there is the Hegelian point that it is only by taking the path of self-alienation that the potential of human thought is fully actualised (Cassirer 1929/1957:432). Secondly, Cassirer emphasises the continuity across the modes of thought associated with the three symbolic functions, and the fact that they co-exist in the life of the mind, writing that “[t]he function of the concept does not create a break in the totality of knowledge—it continues a basic trend which already proved to be at work in the first stages of sensory, perceptual knowledge” (Cassirer 1929/1957:307). Thirdly, in contrast with the “abstractive closure” [*Geschlossenheit*] of post-Galilean physics that Husserl depicts as the vessel in which all natural science since then has been contained (Moran 2012:69), Cassirer emphasises the open-endedness of conceptual thought in science. Drawing on the Marburg tradition, the progress of science is presented as the unfolding of a series of symbolic forms which heads towards an ideal limit of truth without ever touching it (Cassirer 1929/1957:478).

Cassirer (1929/1957:403) concurs with Weyl that the imposition of mathematical forms onto the “flow of intuition” is not a “schematizing violence” because, if scientific knowledge is to be

⁴⁰ See also the discussion of Planck (Cassirer 1957:431-2).

obtained, the indeterminacy of the intuitive, perceptual world must be put to order through the deployment of exact theoretical concepts. This is how universal concepts serve as a guide to the confusing and variegated world of the senses, such that the exiled hero can find his way home to triumphant return:

Does not the meaning of concept formation consist precisely in the fact that it gives us an Ariadne's thread *within* the labyrinth of the many and the particular? The genuine concept turns away from the world of intuition only in order to lead back to it with all the greater certainty: it serves to determine the particular itself. (Cassirer 1929/1957:309)

Just after this passage, Cassirer appeals once again to Gelb and Goldstein's research on categorical colour perception in order to buttress the claim that such conceptual operations do not first appear with the emergence of scientific thought, as a fundamental breach or rupture from everyday perceptual concept formation.

3.3 *Mere Abstraction*

That was Cassirer's story of the progress of knowledge in physics. An obvious objection to Cassirer's optimistic story about abstraction is that concept formation via functionalisation is only a fitting account for mathematical physics and some branches of chemistry, whereas concept formation in biology, because of the inherent variability amongst living individuals, must involve generalising averages that *do* result in loss of particularity.⁴¹ This is not a minor failing of the account because it is precisely regarding the living world that the worries about conceptual and instrumental domination are most felt. Thus it should not surprise us that there are important points of difference between the accounts of Cassirer and Goldstein -- the theoretical biologist -- on scientific concept formation. The discussion, in *The Organism*, of the impossibility of obtaining genuine biological knowledge through the procedures of physical science presents an interesting counterpoint to Cassirer's attempt to neutralise concerns about the abstract and distorting tendencies of scientific thought. While Goldstein makes explicit statements endorsing Cassirer's

⁴¹ *Substand and Function* has no discussion of the modern life sciences. In the *Philosophy of Symbolic Forms*, Cassirer does not state that abstraction via functionalisation will apply also to biological science, nor does he deny that it will. So in neither work does he address this objection.

philosophy of science,⁴² he pours much criticism on research in biology, psychology and medicine which has followed the *modus operandi* of the physical sciences, using controlled experimental conditions in order to generate repeatable phenomena which can be associated with precise concepts. More often than not he uses the term “abstraction” in the pejorative sense of “mere abstraction” – artifices that divert the biologist’s attention away from the actual nature of the organism under investigation.

For example, one of the opening moves of the book is to dismiss the theoretical relevance of the study of reflexes as the building blocks of complex behaviours. Even their apparent simplicity is an illusion, brought about by abstractive habits of mind:

Very often, the simpler performances have been found to be abstractions, and the events which the latter aim to explain turn out to be ‘simple’ only in the presence of a specific, habitual, technical attitude of abstraction. (Goldstein 1934/1939:2; cf. 79)

A major claim of Goldstein’s is that every pathology *or* experimental intervention will generate effects which ramify throughout the whole organism and the scientist trained to observe as if through a grid which isolates one body part or psychological function from another will be oblivious to such effects (Goldstein 1934/1939:214). Though not stated explicitly by Goldstein, an implication of this radical holism is that there will be a fundamental mismatch between the living body and any cleanly defined, unambiguous concepts of the sort that Cassirer takes to be definitive of advanced natural science. Each state, of every particular part of the body will be “ambiguous” because its meaning can only be deciphered in the context of the whole, and the condition of the whole is itself always changing.

It is because of the limitations of results arrived at via abstraction that Goldstein rejects the incorporation of biology into the physical-chemical sciences, even though he does not posit any special vital forces.⁴³

⁴² “The mathematico-physical scientist was the first one to realize clearly the symbolic character of his basic tools, as Ernst Cassirer explains.” (Goldstein 1934/1939:410)

“There is no direct transition from collecting and ordering facts, as empiricism does it, to physical knowledge. Cassirer believes it is a matter of a transition to a new perspective.” (Goldstein 1934/1939:411)

⁴³ See Goldstein (1934/1939:421) against Hans Driesch and his notion of “entelechy”.

By virtue of the isolating, dismembering procedure one can readily abstract and single out from living phenomena, those phenomena on the physic-chemical ‘plane.’ But the attempt to reintegrate the elements thus abstracted, to reorganize these split-off segments into the reality of living nature, is doomed to fail. This vain attempt, however, is made again and again, overlooking the fact that it is quite possible to understand the part on the basis of the whole, but that it is not possible to comprehend the whole on the basis of the parts. (Goldstein 1934/1939:498; cf. 207-8)

In other words, by taking the most precise concepts of physics and chemistry and employing them “to determine the particular”, all we would be left with would be a set of abstracted versions of the constituents of the organism, which we should not mistake for a genuine articulation of its structure and functions. Any picture of the whole organism built via reconstruction from such artificially generated parts would be a monstrous distortion. Goldstein’s concerns about abstract methodologies are not reserved for the obvious targets in experimental physiology and biochemistry. Freudian drives are criticized as “abstractions from natural behavior of the organism” (Goldstein 1934/1939:203), and he even questions whether anything can be learned from the isolating experiments of Gestalt psychology (378).

That said, Goldstein did not desist from all such isolating procedures in his own research. We are left with a paradox: failing to appreciate the “natures” of organisms in biology entails a “violence” of “preconceptions” (Goldstein 1934/1939: 3), yet “dissective” methods are indispensable to biology:

We will not be satisfied with any form of intuitive approach. Every natural science, indeed any science at all, must start with an analytical dissection. So too, in biology we must first observe the ‘parts’ of the organism. We are forced to accept this point of departure because a naïve approach to the phenomena is not feasible, unless one is to be content with fictitious generalities. (Goldstein 1934/1939:9)

In the next section of this paper I will show that Goldstein’s attempt to overcome this paradox by invoking *sui generis* methods of observation for biology has interesting similarities with Cassirer’s characterisation of the “expressive function”.

4. The Autonomy of Biology and the Plurality of Symbolic Functions

4.1 *Expressive Perception and the Holistic View*

A feature of Gelb and Goldstein's theory of the concrete and categorical attitude is the claim that the healthy individual can voluntarily switch between these attitudes whereas pathology is marked by a rigidity of mind and the subject is "stuck" in the concrete attitude. Goldstein states that the biologist needs to develop a capacity to regard (both literally and metaphorically) the subject of investigation in two different ways, not only in the usual atomistic manner of the physical sciences, but also in a holistic mode:

[A] competent natural scientist, especially a biologist, must possess the faculty of combining both points of view, although he may at times not admit it. In other words, he must at one time use the dissective approach, at another, the holistic. Sufficient understanding can only be gained when these two forms of cognition influence and supplement each other continuously. Was this not true of Goethe himself? (1934/1939:414)

However, the characteristics of the holistic vision are left under-specified. We are told that it is *not* a mystical intuition but are not given a detailed, positive account of its capacities and limitations, other than it being described in passing as a Goethean "Schau" (Goldstein 1934/1939:402) and also as a kind of Gestalt formation (Goldstein 1934/1939:413).

There are reasons to think that Cassirer's notion of the expressive function is in the background to Goldstein's thinking on the idea of a distinct, holistic point of view. The following passage is suggestive of the expressive function, though Goldstein refers to it as the "attitude of immediate experience":

Nature confronts us, so to speak, as a still undismembered unity; and by no means is this mode of apprehension only that of non-erudite, unsophisticated, or primitive man. It may even be present in the 'Weltanschauung' of the scholar, along with his scientific analytical approach. Moreover, it frequently determines and pervades his ultimate conception of nature. The eminent physicist, also, though resting entirely on the empiricism of the anatomizing

method in natural science, may exceed, in his ultimate ideas of nature, the bounds of this empiricism. These ideas of nature, are frequently implicit or explicit categories or concepts, and are required for dealing with the holistic character of life. Then one has to concede that the results gained by the analytical method represent only *one* ‘part aspect’ of the whole world... (Goldstein 1934/1939:497)

The link, here, is that it is characteristic of the expressive function to take things in as a whole rather than isolated parts, and this function is also claimed by Cassirer carry on its workings even in the most sophisticated, scientific minds. Speaking of “experiences of pure expression”, Cassirer (1929/1957:68) writes, “[i]ts reality is not an aggregate of things endowed with definite characteristics by which they can be known and distinguished from one another”; rather, the experience is taken in as a whole and the individual components are left unanalysed.

Another point of commonality between the expressive function and Goldstein’s holistic mode of apprehension is the prominence of the qualitative features of experience, in contrast with a purely abstract, quantitative reckoning of things. For the expressive function these are the sensory qualities of colour, sound, and bodily experience, along with affective qualities such as the pleasantness of an experience or the mood of a visual scene.⁴⁴ Goldstein (1934/1939:413) writes that, in contrast with physics “[t]he symbols, the theoretical representations in biology, must, in principle, include quality and individuality in all their determinations. Biological descriptions must exhibit definite qualitative organization.” He does not indicate further what such symbols shall be like, but this very statement is significant because the rejection of all qualitative representation from the sciences was so central to the logical empiricist project – all science was to be done in the austere mathematical-physics style, where only quantities are to be cognized and granted objective status.⁴⁵ Of course this raises the concern -- which was the decisive concern for the logical empiricists, and looms also for Friedman (2000:155-6) -- over how the qualitative and presumably subjective mode of apprehension could have any intersubjective validity. Cassirer’s

⁴⁴Strictly speaking, in the expressive experience there is not even a division between the different qualities associated with the five sense organs, nor between perceptual and affective qualities of things (Cassirer 1925/1955: xvi).

⁴⁵“According to Carnap, *only* the purely abstract world of physics (and not the qualitative world of common-sense perceptual experience) ‘provides the possibility of a univocal, consistent intersubjectivization.’” (Friedman 2000:74)

later work on the cultural sciences was intended to show that expressive perception does have its own kind of objectivity, so that the claims within aesthetics, for example, are not merely outbursts of personal reactions.⁴⁶

On Cassirer's view, the expressive perception of others as subjects in their own right is an irreducible fact of experience, for which any attempted explanations prove to be circular (Cassirer 1929/1957:92). Another important feature of Cassirer's account is that understanding in terms of cause and effect relationships is excluded from the discussion of the "phenomenon of expression":

[A]s Goethe said, the most indigenous and necessary of concepts, the concept of cause and effect, threatens to lead us astray, for the application of the category of causality to the pure expressive function cannot explain it but can only obscure it by robbing it of its character as an authentically original phenomenon. (Cassirer 1929/1957:92)

In Goldstein, we find that the therapeutic relationship between doctor and patient must go beyond the physician's deployment of knowledge of cause and effect in the diseased body, so that it includes a dimension of mutual recognition between two subjects:

he [the physician] will be able to do so [give guidance to patient], only if he is completely under the conviction that the physician-patient relationship is not a situation depending alone on the knowledge of the law of causality, but that it is a coming to terms of two persons.... This emphasis on the personal relationship between physician and patient marks off, impressively, the contrast between the modern medical point of view and the mere natural-science mentality of the physicians at the turn of the century. (Goldstein 1934/1939:449)

It is worth considering whether the recognition that on some level medical practice is an interaction between two subjects which cannot be explicated according to the causal laws of natural science is related to Goldstein's longstanding insistence that detailed, individual case studies are indispensable in neurology. Furthermore, one may note that individual neurological cases are one-of-a-kind unrepeatable events. The idea that the physical, in contrast to the human sciences, deal

⁴⁶ E.g. lecture of 1943, "The Educational Value of Art" (Cassirer 1979). See also Krois (2010:267) for the claim that Cassirer's plural system of symbolic functions is what enables him to account for the validity of knowledge claims in both the mathematical natural sciences and non-mathematical cultural sciences.

only with general and repeatable events is found in Cassirer (1929/1957:409) and Husserl's *Crisis of the European Sciences* (Moran 2012:93), and was a theme of debates over the historical sciences, prior to them. Attention to the one-off character of neurological cases is one way to demarcate their study from the kind of events appropriately studied using physicalistic methods, and to encourage the classification of this field as autonomous from the physical sciences.

Goldstein's assertions of the independence of biology from the physical sciences is striking in comparison with the "unity of science" project of the logical empiricists, which sought to reconstruct all language in which knowledge claims are formulated according to the model of the language of physics (Sebestik 2011); any statements recalcitrant to such ordering would be discarded as "non-cognitive" and merely "expressive." It has been noted elsewhere that Cassirer's philosophy of the cultural sciences, in particular his account of the objectivity of "expressive perception" [*Ausdruckswahrnehmen*] was intended to obstruct Carnap's assimilation of the human and social to the physical sciences.⁴⁷ We may conclude that Goldstein's supposition of a distinctive holistic point of view, to be employed in biology, is an analogue to Cassirer's deployment of expressive perception and that both serve the purpose of maintaining the validity and autonomy of the non-physical sciences.

4.2 *Direction of Influence?*

In this essay I have endeavoured to be non-committal about the direction of influence between Goldstein and Cassirer. It is known that the two cousins met and corresponded frequently during the time period examined here (Métraux 1999). However, my study has relied on published sources rather than the correspondence, and a detailed study of their written exchange of ideas would be required in order to begin to address questions of priority for the specific philosophical positions that, as I have aimed to demonstrate in this essay, were shared between the two of them. Furthermore, the overlap in Cassirer and Goldstein's published opinions may also be explained by their sharing of common influences regarding the nature of biological knowledge – the most

⁴⁷ See Krois 2010:268-7; Skidelsky 2009 chapter 6. They refer to Cassirer's works of the 1930's and 40's, in particular.

obvious possibilities being the scientific writings of Goethe, Kant's *Critique of the Power of Judgment*, and the work of von Uexküll.

Firstly, von Uexküll, in work cited both in *The Organism* (chapter 2) and in manuscripts for the *Philosophy of Symbolic Forms* (Cassirer 1996: chapter 1), argued for the autonomy of biology from physics and the need for biology to go beyond causal explanation:

It is not surprising that physics should attempt to explain all associations in the world by causality alone, rejecting any other way of considering them. And yet physics is wrong, for causality is not the only rule at our disposal for systematising the world. (von Uexküll 1920/1926: 99; cf. 103)

The similarity with the opinion that I have here reconstructed from Cassirer and Goldstein is worthy of attention. Also in a recently published note for the *Philosophy of Symbolic Forms*, one finds a very clear attribution to Goethe of a mode of viewing nature that relies on the expressive rather than signifiatory function, that is an alternative to the approach of (Newtonian) mathematical science:

There is also a way of grasping 'nature,' as exemplified by Goethe which remains entirely within the limits of the expressive whole and the perceptual whole – 'Willst Du Dich am Ganzen erquickern, so muss Du das Ganze im Kleinsten erblicken!'

This direction of our 'glance' at the whole ... defines a specific way of regarding things which must be strictly distinguished from having a view of the 'system' ('signification,' Newton). (Cassirer 1996: 200)

I will not here speculate on the precise role of the Third Critique as "common cause" of Cassirer and Goldstein's philosophy of biology, because I have not found any detailed discussion by Goldstein of that book, and because Cassirer's most substantial discussions of it fall outside my period of focus.⁴⁸ In sum, I prefer here to defer the question of direction of influence between Goldstein and Cassirer, and keep open the possibility that the overlap in their opinions is due to their having a shared set of intellectual influences – or, indeed, adversaries. It remains an interesting puzzle for future archival research.

⁴⁸ But see Ferrari (1996: chapter 3), who makes the case for there being a continuity across his career, in the importance of the third Critique to Cassirer's thought.

5. Conclusions and Directions

At the outset of volume 1 of the *Philosophy of Symbolic Forms*, Cassirer (1923/1955:76) makes a passing remark about the independence of the “objects” of the different natural sciences:

Even in ‘nature,’ the physical object will not coincide absolutely with the chemical object, nor the chemical with the biological—because physical, chemical, biological knowledge *frame their questions* each from its own particular standpoint, and in accordance with this standpoint, subject the phenomena to a special interpretation and formation.

In this essay I have argued that remarks such as this one are indicative of a broader agenda. In presenting a theory of knowledge, symbolism, and concept formation that upheld the autonomy of the various sciences, Cassirer shared a common cause with Goldstein. Both offered a version of the modern scientific worldview that was far less austere than the physicalism of the Vienna Circle. By providing a place for holistic and expressive modes of thought and perception within the sciences, Cassirer and Goldstein’s proposals offset concerns about the inhospitable, purely instrumental and potentially violent character of the modern scientific method and mathematised world picture.

Cassirer gives a portrait of symbolic thought and perception as both a universal human endowment, underlying all forms of spontaneous and creative activity across history and culture and, in its purest form, as the principle behind the most elevated forms of knowledge -- those achieved in the exact sciences. The positive evaluation of the categorical attitude offered by Goldstein, and endorsed by Cassirer, should be taken as an intervention into Weimar debates over the “crisis” of rationality, with all of its political dimensions such as the link between anti-Semitism and anti-intellectualism. Goldstein had written in 1931 about a crisis in medicine and a worrying tendency “toward the irrational and the mystical, fed by enormous dissatisfaction and doubt regarding the possibility of a rational ordering of life” (quoted in Harrington 1996:162). While the logical empiricists regarded holism as a philosophical buttress of fascist mythology (Galison 1990), in Goldstein’s view it is holism that allows him to assert that it is “only through mind that man reveals

his nature” (Goldstein 1934/1939:335), because it rejects the unfortunate dualism of “Geist” and “Leben”.

Cassirer did not write specifically on politics until the end of his life (Cassirer 1946), but remarks in private to his wife, Toni Cassirer (Skidelsky 2009:220) on the event of Hitler’s rise to power do indicate that his publications during the previous years were not unrelated to the political cause of the liberal republic. Cassirer and Goldstein can be seen as advocates of a humanistic universalism, in contrast to the race-based theories of culture and cognition that were coming to dominate the German academic scene. Moran (2011) argues that the strengthening of universalist ideals was one of Husserl’s central aims in the *Crisis*, written in the mid 1930’s. Such points of common cause, in the midst of significant differences in methods and outlook, deserve further scrutiny.

Furthermore, there is a need to re-evaluate Michael Friedman and Peter Gordon’s picture of Cassirer as an intermediate figure between the left-wing logical-rationalism of Carnap and right-wing anti-rationalism of Heidegger – as both a political and philosophical centrist. This misses the distinctive characteristics of Cassirer’s philosophy – his multifaceted account of the modes of human thought, which goes along with a normative picture of the human individual and society that is itself (cognitively) pluralistic. The ‘ideal’ organisation of human capacities, for Cassirer, is one in which the symbolic functions are harmonised and balanced such that the “expressive” modes of experience co-exist with the most abstract, technical modes of encountering the world, and where each function may be used appropriately in its domain. In contrast, the normative pictures one gleans both from Carnap and Heidegger are less pluralistic in that they assert the primacy of one style of thought or experience. As Cassirer acknowledges, the overriding tendency of philosophical world-views is to suppress this diversity and therefore flatten the texture of human reality. He writes that in the usual run of things, each world-view,

separates out a single one from the totality of possible concepts of reality and erects it as a norm and model for all the rest. Whether we determine ‘matter’ or ‘life’, ‘nature’ or ‘history,’ as this ultimate being, a degeneration of our world-view always finally results in this way, because certain spiritual functions that contribute to its construction [*Aufbau*] appear excluded, whereas others, by contrast, appear one-sidedly emphasized and privileged. (Cassirer 1921, quoted in Friedman 2000:97)

Further work should be pursued on the relation between Cassirer's ideal of pluralism and Goldstein's normative theory of health, which requires a balance of interrelated capacities and an alignment with external challenges.

Another problem with the analysis of Cassirer as a figure straddling the extremes of "analytic" and "continental" philosophy is that it relegates his thought to having less contemporary relevance than it deserves. The governing metaphors of a "parting of the ways" (Friedman 2000) or "continental divide" (Gordon 2010) present us with a tectonic breach between traditions that is now unsurpassable, even though it was bridgeable in Cassirer's own time. However, if we give credit to the distinctiveness of Cassirer's own brand of pluralism we may envisage it as a path still worth pursuing, especially given the intense interest in pluralism in philosophy of science today.⁴⁹ Just as contemporary structuralists have read the early Cassirer of *Substance and Function* as a founder of their lineage, pluralists would do well to examine the Cassirer of *Philosophy of Symbolic Forms* for a systematic account of objectivity within disciplinary and methodological diversity.

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⁴⁹ E.g. Massimi and McCoy (2019); see also Honenberger (2016) on Cassirer and the philosophical anthropology of the 1920's in relation to today's philosophy of science.

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