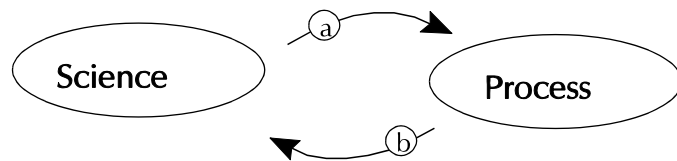


Conclusion:

Thought set free with regard to science

Although the present work is a collection of works dealing with rather different questions in different contexts, it is one project by virtue of a distinct double problematic: It aims at an understanding of the nature of **process**, and it finds in **science** a particularly important nexus of resources and challenges for such an understanding.

The work with this problematic has provided support for the view that this really is one distinct problem, even if a complex one. Indeed, it may be a good illustration of Deleuze's point that, contrary to Cartesian assumptions, distinctness and clarity are complementary so that great distinctness must be associated with considerable unclarity. Still, there is no harm done in expressing things simply and even in a naively clear graphical image to begin with, as long as we are prepared to follow through the implied complications, also when such following through may result in



somewhat less simple distributions of ideas such as the distribution expressed in the list of titles in this collection. The very clear dynamic double sided relationship expressed in the graph is that

- a) science deals with the processes in nature — and elsewhere, if there are fields we find it wise to consider non-natural, e.g. thought or social relations, and
- b) science is itself in process, it is embodied in processes.

This embodiment is not a problem, at least there is no reason we should make it a problem in the restrictive sense that calls for any kind of scepticism or suspicion regarding the modern sciences as channels from which one could hope to learn something about what a process is, and what the relation is between process and time, substance, etc. In fact, as several of the papers have discussed, there are many respects in which processual characteristics of nature have been rising up to the foreground in fields of study and technical methods, in contrast to earlier versions of objects and ideas which have been more focused on identities and stabilities. There

is, of course, an ongoing philosophical discussion of the significance of such features of nature as disclosed in the sciences — a discussion which is often pursued within the official discipline of “philosophy of science”, but just as often by scientists reflecting on more general implications of the results of their own disciplines. At the point where these discussions produce questions and suggestions about structures at the highest levels of universality, philosophy of science seamlessly and continuously merges into metaphysics, and this is the point where the question of the nature process was first asked, in Chp. 2, entering the ongoing discussion of the sense of irreversible and reversible processes in thermodynamics and statistical mechanics.

Metaphysics, the great tradition of explicating and developing categorial schemes and pursuing problems on the nature of reality, is one of the two main approaches discussed in this thesis. Such an interest and project is no less metaphysical for proceeding, to some extent, via the sciences. Indeed, scientific and technological developments have been major resources and challenges for metaphysical developments for quite a while: think of the role mathematics played for Plato, or biology for Aristotle. Within the scope of a good metaphysical discussion, such elements as conceptual structures, paradigmatic objects, and modes of formulating problems, pass over the seamless junction from science and the philosophy of science. Of course there are other elements which enter too — modes of experience and expression from art and religion, for example, and philosophical attempts at directly addressing the conditions of concrete life. What the metaphysical discussion is about, then, is the attempt at making coherent, relevant sense of all of this. In other words, metaphysical discussions, classical and modern, have given great significance to structures from science, but they have also attempted to integrate them, to varying degrees, with structures from elsewhere. An important recurring theme of metaphysical discussions regard the balance.

Science studies is the other main approach discussed in this thesis. It is a much more recent and much more specific enterprise. However, it is very important for our problematic, because it addresses the second relation, the (b) in the simple graph above. The emerging tradition of science studies has achieved ways of studying and discussing the ways the sciences are themselves incarnated in a web of constructive processes: institutional, bodily, mechanical, social, etc. To be able to do so, they have invoked methods and models from studies of such other fields of concrete life: sociology, anthropology, psychology, economics, management theory, engineering, political science. Many of these science studies have tended to become reductive and to produce the kind of scepticism regarding the truth or relevance of scientific content I just mentioned, other such studies have tended to the opposite extreme of reducing the relevance of their own studies to superficial aspects of form of science. But some workers in this emerging field have been able to make important

contributions to an understanding of science and technology in terms of an active processing and co-construction of their world, that is, as a participatory rather than representational or mis-representational business. The work of Andrew Pickering and Bruno Latour represents this tendency very well and has played a major role for this thesis. Not surprisingly, Pickering's and Latour's work has led both of them to address metaphysical questions of the nature of processuality and constructive processes, and I have enjoyed the great privilege of discussing it with them along the path of this project. The Chapters 5 and 7 in this collection have grown out of such discussions; both of them try to work both ways: making some of the resources from the metaphysical tradition available for the speculations emerging within science studies, and making some of the wealth of fresh and concrete insights into the embodiment of science available for the ongoing construction of a metaphysics of process.

A reader of my introductory remarks asked if the present project could be summarized in terms of a combined interest in metaphysics and science studies as ways of thinking which are *set free regarding science*. As I hope the studies in this collection have helped make clear, thought should not and cannot be free from science. Metaphysical thought, emerging from and expressing itself into a world in which science and technology are ever more abundant participants, does not gain any positive freedom by escaping science and technology, just as science and technology studies reduce their own scope greatly if they interpret science and technology as mere functions of something more real or essential, such as power relations. But, as I have argued, there is another and more lively freedom thought can gain here: the power of thinking in and with science and technology — as well as in and with religion and art. This is the affirmative, “machinic” thinking of Latour, Haraway and Pickering, and it is the immanent approach to speculative philosophy that we have followed, in the present collection, in process thinkers such as Hegel, Deleuze and particularly Whitehead — the approach that allowed them to connect a sober focus on local, concrete processes with wild cosmological speculation.

What is it to be in process

The enterprise of this thesis started out with the apparently more humble project of understanding the ideas of reversibility and irreversibility used to characterize processes and regularities in thermodynamics. We found that a certain argument or method has been held to be very authoritative at the truly fascinating point where the debates over these matters take the slide into metaphysics: the symmetry argument, which proceeds by constructing and purifying the notion of time reversal and then using it to criticize as ungrounded every tendency of understanding irreversibility as belonging to the nature of things. As we saw, this authority is held to lie in a certain kind of clarity of penetrating the matter in complete depth, and an ensuing power

of revealing the points of unclarity where opponents lapse into the hidden introduction of asymmetries without sufficient reason. But as we also saw, this terrifying clarity radiates from a point which is itself held beyond the requirement of sufficient reason: the metaphysics of a pure time released from the content of any processes, and the corresponding metaphysics of passive substance released from any becoming. It is very remarkable, when such importance and authority is ascribed to the completeness and clarity of vision penetrating to reveal all open and hidden assumptions, that hardly anybody is interested in affirming this underlying metaphysics of modernized time and substance — particularly, the wielders of the symmetry argument are not interested in anything of the sort.

Why not? Our later discussions of the possibility of an affirmative and constructive approach to speculative metaphysics have pointed to a likely reason. The dominant modern scheme of metaphysics is generally not supported by affirming it but by dissolving it! It is quite well known, for instance, that the notion of substance is open to sceptical dissolution through analysis of processes in the mind in which the notion is formed. However, it is also generally understood that in practice it is out of the question to abolish such structures of understanding. The explicit or usually implicit conclusion drawn is that it must be valid anyway, as a pragmatic or transcendental condition for proceeding as we do. In our discussions here, we have not been attacking the general drift of the transcendental or pragmatic argument that we need certain assumptions of structure in order to navigate in the world. What we have been problematizing, however, is the disinterest in positive involvement and the conservatism regarding positive metaphysical structure which follows from the oscillation between pure disbelief and untouchable transcendental assurance. Such a problematization, of course, could only be interesting if alternative strategies can be found.

This is exactly what Whitehead's affirmative approach to speculative metaphysics provides one elaborate contribution to. Rather than an all-out attack on all structure from a vantage point of clearly available mental processuality, Whitehead accepts, on the one hand, the unavailability of any absolutely clear vantage point, but on the other hand, the participatory connectedness with a world of many multiplicities and mixtures. And what he proposes to do, from this immanent acceptance of involvement, in all its unclarity and ambiguity, is the continuing construction and testing of ever more coherent and flexible metaphysical schemes, along with and continuous with the construction of local schemes we are always already involved in, and in the light of the structures and experiences emerging in the local involvements. As we saw, this approach allowed Whitehead to construct a speculative scheme of “process thought”, or, as he also termed it, “philosophy of organism”, which strongly and explicitly affirms most of the metaphysical structure that we moderns depend so

much upon while we have come to view it as untenable: substance, causality, God, progress. But this strong affirmation comes along with an attempt to continue their expression and universalization in the light of new emerging fields of experience and expression, and guided by the notion which became Whitehead's key to speculative synthesis: the process.

I have argued that Whitehead's synthesis was more successful, and more relevant for questions of great importance today, than usually acknowledged. And its merits are no less for sharing so much of its thrust with a small group of other thinkers (including Leibniz and Bergson, and particularly Hegel and Deleuze) who agreed, not only in calling for more dynamic categories for modern thought, and not only in trying to speculatively produce such structures in spite of the anti-speculative sentiments of the age, but most of all perhaps in the very affirmative interest in science as the source of rich experiences and creative conceptualizations of processes on many levels, and as itself in the process of a great adventure.

We entered the debates of the interpretation of thermodynamics as one discussion of some philosophical importance today which carries a kind of "metaphysical deficit". This kind of opening is not intended to gain support for the suggestion of a process metaphysics by exposing hidden weaknesses of the temporal symmetry argument or the reductionist standard interpretation of the second law of thermodynamics. It is more interesting to see these related projects as achieving the expression of a good metaphysical problem, the directedness of physical processes, and then to try out if process metaphysics can contribute to the expression, perhaps even to the solution, of this problem.

Two of the articles in this collection are directly aimed at showing such a usefulness of Whiteheadian process metaphysical structures in much debated questions of the significance of the concept of time in modern physics. The first question was that of the nature of temporal asymmetry in thermodynamics and the general question of directedness or striving; the second was that of the context dependence of the simultaneity relation introduced by the special theory of relativity and the general question of a cosmic "passage of time" or becoming. What we found in both cases was that it was possible to interpret some central problematic features of these physical theories as expressions of structures which were integral to the general process scheme. We can even express this in traditional terms which makes obvious the familiarity of the present project with the tradition of speculative philosophy of nature: what we found was, in a certain sense, that central structures of the theories in question can be *derived* from the speculative principles of process metaphysics. In order to avoid a common misunderstanding of this kind of procedure in the philosophy of nature, I repeat here that such derivation of known truths obviously

provides no logical underpinning for the premises from which the derivation proceeds; and I could add that it is no wonder that one can find certain aspects of the special theory of relativity to be implied by structures in Whitehead's categorical scheme when this scheme is obviously designed with the intention of taking them into account — cf. Whitehead's "principle of relativity"¹. What is an interesting philosophical achievement, however, is the construction of these premises in such a way that they exhibit great internal coherence and simplicity, that they enfold characteristic features of not just thermodynamics and relativity but many other modern subjects and objects and, furthermore, that they also affirm and enfold those aspects of intuition and concrete experience which have traditionally been invoked in defence of traditional metaphysical understandings against the "attacks" from science-based views of time.

Finally, two of the articles made use of the conceptual scheme of process metaphysics in the discussion of the nature of scientific development. First, we saw a very close correspondence between Whitehead's metaphysics of process and Bruno Latour's sociology/anthropology of collectives. This correspondence turned out useful two ways: we were able to use Latour's examples to expand and exemplify Whitehead's use of the notion of a society of processes, and we were able to use Whitehead's dynamic relationist understanding of reality to express, conceive and suggest interpretations of an apparent ambiguity in Latour's work. The initial difficulty is an apparent ambiguity in the nature of the historicity of scientific objects and theories which is brought to light in science studies, and the corresponding notion of construction. The ambiguity first presents itself as a dilemma between scepticism and scientific realism, but as the joint problematization of science studies and process metaphysics brought out, there is a third and more interesting possibility. This is not a compromise but rather a radicalization of the notion of constructivism to the point where there is nothing whatsoever that stays free of construction — that is, there is no subject, society, divinity or collective that constructs anything without itself being co-constructed by it. Contrary to moderate constructivism, this wild constructivism implies a great respect for the very stubborn and real way that the non-human things in the world contribute to the ongoing construction of each other and the cosmos. The other article traces in Hegel and Deleuze the same structure of process thought unfolded as a radical affirmative constructivist approach to science.

The last article looks back upon the others and reflects on the kind of speculative philosophy which has been followed in Whitehead and other great process thinkers, and been exercised in some smaller ways by myself. It is concluded that Whitehead has not set up, and that it would indeed be futile to try to set up, a procedure for

¹"Categories of Explanation", (iv) and (v), *Process and Reality*, p. 22-23.

9.7 — CONCLUSION

speculative thought which would make sure it does not make what will later be recognized as mistakes. It must be adventurous — thinking without the risk of adventure involves the certainty of decay into irrelevance. This does not mean that there are no standards. The standards Whitehead sets up for speculative philosophy involve comprehensiveness — that is, the commitment to find and express “overseen halves of the evidence” — coherence, and the commitment to find and express new levels of simplicity. But none of this will work without creativity. It is very important that creativity is expressed by Whitehead — as by Bergson — as a very worldly process. Creativity, according to them, is not the breaking of patterns in the situation that others used to respect — it is the finding and expression of even more patterns and commitments.

Process time

We started out, in the introduction, with an outline of a processual reconstruction of modern ideas of time, given in the form of a list of hypotheses. As these concluding pages show, this work has been all connected in the investigation of possibilities and implications of a strong notion of processuality. The investigation has not had the kind of form which could possibly allow us, at this or any other point, to *prove* such a speculative hypothesis. But we have achieved a considerable distinctness of it.

We are now in a position to suggest that time is thoroughly constructed, without implying any of the traditional sceptical consequences that things do not happen or that past and future are no different.

We are also in a position to start asking what to do with such a construction. The following “reintroduction” opens such a line of inquiry.