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The Modernity of Science*

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So far as one can see, science has never had any trouble representing itself as "modern," nor has it ever stood in need of doing so. The modern states — that has been a topic. The modernity of modern society is being discussed at length in sociology.[1] And today, one still asks what modern art is. Yet as regards the field of science, its modernity does not even seem worth questioning, let alone an argument.[2] Its modernity seems to go without saying.

As is well known, Max Weber attempted to determine the specificity of European modernity by way of a cultural comparison of immense dimensions. Since this attempt has never been superseded but, at best, only been repeated with new data, sociology is today still under the spell of this

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     1.   These discussions are not without converging judgements. On this issue, see Johannes Berger, "Modernitätsbegriffe und Modernitätskritik in der Soziologie," *Soziale Welt* 3 (1988): 224-36.

     2.   Richard Münch, *Die Struktur der Moderne: Grundmuster und differentielle Gestaltung des institutionellen Aufbaus der modernen Gesellschaften* (Frankfurt/Main: Suhrkamp, 1984). Münch explicitly discusses the modernity of "occidental" science (see especially 200ff.), but he does so, on the one hand, in terms of the generic concept of culture and, on the other hand, without any reference to the modernity of the social system. What is mentioned here remains nevertheless quotable: "What distinguishes modern occidental science from all other forms of thinking, verifying, experimenting, and solving technical problems, is that it unites, in a way unique only to itself, abstract constructions of concepts and theories, deductive-logical evidence, rational-empirical experiments, and practical technology" 200. However: one can only speak of "deductive-logical" with regard to postulates of the theory of science, not in view of the practice of scientific research itself.

thought experiment. Apart from all the weaknesses of the theoretical foundations of such a comparison, weaknesses that cannot be sufficiently clarified by the comparison itself but must be presupposed, it is the lasting merit of Weber's enterprise to have pointed out regional and historical contingencies. At the same time, however, the *"regional"* comparison does not do justice to what is *historically* new. For, as Max Weber indeed recognized, the novelty lies in the final analysis, not in the relation to Europe's own history. Otto Brunner's concept of "old European" structures and semantics does greater justice to this aspect. It, in turn, however, lacks any kind of theoretical analysis.

In the context of these data, one can at least begin to recognize that modern society produces its own newness (why does society have to be "new"?) by way of stigmatizing the old. The dismissal of the "world of one's fathers," its degradation to mere history, seems to be imperative for any self-description of modernity. This devaluation places increased burdens on the persuasive power of self-interpretations[3] and thus leads to irreconcilable controversies. Initially, science was able to distance itself successfully from these controversies, and today it feels the effects of the problematization of the semantics of the modern age as if from the outside — as an undeserved fate, as it were, an irrational attack, a lack of expertise. The modernity of science consisted in the progress of knowledge itself; science was more or less constant modernity. Caesuras came about through methodological and theoretical discoveries that opened up new fields of research, enhanced the power of dissolution [*Auflösevermögen*], or put the extensive and complex collections of knowledge in their final classical form: Euclid, Newton. Such a concept, however, makes it difficult to recognize a connection between modern science and modern society. The factual contents of knowledge resist a historical as well as (for the same reason) a socio-structural classification. And bivalent logic, together with the epistemology based on it, does not provide any alternatives to this situation. If knowledge is true, it is always true (which, of course, does not include the claim that the object of this knowledge must always have existed).

Up until Thomas Kuhn, all earlier descriptions of the world that did not correspond to the latest developments in research were regarded as more

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3.   Cf. Horst Folkers, "Verabschiedete Vergangenheit: Ein Beitrag zur unaufhörlichen Selbstdeutung der Moderne," eds. Dirk Baecker et al., *Theorie als Passion* (Frankfurt/Main: Suhrkamp, 1987): 46-83.

or less failed attempts at scientific knowledge — as double entries, as it were, in the book-keeping of scientific progress under the directive of a unified truth in one and the same world. It is only with Kuhn's incommensurability thesis that precursor theories, insofar as they are based on different "paradigms," are released from the current world of truth and historicized. Together with this development, all stable foundations for the determination of the specific modernity of today's science went overboard. One could only say: we are dealing with a different paradigm whose claim to superiority can be formulated only by its own means. The constructivism of modern epistemology is grounded only in itself.

The analyses presented here[4] contradict this view. The basic idea is that of a connection between the functional differentiation of the social system and a constructivist self-understanding of science. Modern society's form of differentiation makes possible, or even enforces, the autonomy of separate functional areas; this is accomplished by the differentiation of certain operationally closed, autopoietic systems. Functional differentiation thus imposes on systems an obligation to reflect on their own singularity and irreplaceability, but an obligation which must also take into account that there are other functional systems of this kind in society. Knowledge — and indeed particularly demanding, advanced knowledge — is consequently only one form of social potency among others. Whether it is economically usable, whether it is to be supported politically, or whether it is suitable for educational purposes, these questions are decided elsewhere. It remains true that verbal communication already presupposes knowledge, and that society is unable to communicate — and therefore unable to exist — without any knowledge. Yet precisely for the expert knowledge of modern science this presupposition does not hold. Society is dependent on this knowledge only in a very specific sense, but not in the autopoiesis of its communication as such.

In a peculiar way, scientific knowledge must stand its ground and take itself back; it must continue to produce new achievements and, at the same time, it must refrain from defining the world for society. To be sure, no one seriously doubts the descriptions of the world furnished by science, insofar as science itself trusts them. Nonetheless, the effect is virtually non-binding as far as other systems of communication are concerned.

The designations that usually register this state of affairs are relativism, conventionalism, constructivism. One can summarize the meaning of

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4. Editor's note: in the entire volume of *Die Wissenschaft der Gesellschaft*.

these concepts in the thesis of a loss of reference. This thesis marks their negative content. Its negativity, however, only arises in a historical comparison with the premises of ontological metaphysics, with its religious safeguards, its cosmos of essences, and its normative concept of nature which prescribes a correct order, even if one accepts the irretrievable loss of these attitudes toward the world and feels compelled to align oneself with relativity and contingency, i.e., with the hypothetical and merely provisional character of all knowledge. A kind of "discontent" with the modern culture of knowledge remains, and perhaps this discontent, too, explains why there is no effort to reflect upon the specific modernity of today's science. Such an effort would only confirm this discontent — or so it seems, given this as yet quite superficial reflection.

The formula "loss of reference" (some say "loss of experience" or, more drastically, "loss of meaning" — some even claim that others no longer believe in their own bodies) summarizes in a single focal point the distance to the old European tradition. The formula, however, is too compact and too negative to open up any future perspectives. What, after all, is "reference" — this is what philosophers are discussing — and what is the case when reference gets lost? What is the "other case" which must be co-intended [*mitgemeint*] by the form of the formula "loss of reference"? In order to pursue these questions, we have to dissolve the problem with the help of further distinctions.

The tacit assumption that truth is not possible without reference to an external world (because this is precisely what is meant by "truth") has led to endless and unproductive discussions of the problem of realism.[5] If, however, the very operation of referring — — we spoke of designating — must be understood as a real operation, one can no longer seriously think that only what it designates (refers to) is real. On the other hand, it is not sufficient simply to change over to the opposite position and maintain the reality of the referring operation. The operation is inaccessible to itself, and for an observer it could only be referred to as something that he designates. This way, one is only left with the existing controversy between realism and constructivism — as if these were incompatible positions.

For us, the impossibility of solving a problem posed in this way indicates that modern society needs to formulate its epistemological problem differently.

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5.   A recent overview can be found in Steve Fuller, *Social Epistemology* (Bloomington: Indiana UP, 1988) 65ff.

First of all, problems of reference and problems of truth must be clearly distinguished. A bivalent logic has tempted (forced?) people to conflate both perspectives. Its only positive value, "truth," designated "being," and therefore articulated reference. The counter-value "untruth" only served to control the act of referring (designating, claiming, recognizing). Under these presuppositions, the loss of reference had to appear as a loss of truth resulting in the paradox of "nihilism," which states that consequently only the untrue could be the truth. Logic was structurally not rich enough to represent more complex relations, and this condition was sufficient for social relations that went along with a world described in a mono-contextural fashion. The talk of the loss of reference (or its semantic equivalents), however, clearly indicates that these conditions have changed.

A first step toward the comprehension of modernity therefore consists in the distinction between problems of reference and problems of truth.

The following reflections arise from the difference-theoretical starting point of our investigations. In other words, they arise from the conception of reference and of truth as form in the sense of Spencer Brown — as a two-sided form, as difference, as the marking of a boundary whose crossing takes time.

For truth, the matter is clear. We have interpreted it as a code, that is, as an intrinsically self-referential difference between *truth and untruth*. In the case of reference, a distinction must be made between *self-reference (internal reference) and external reference*. Both sides of this distinction are only given together with their respective opposite. A retreat into pure self-reference in the face of the lamentable condition of the world would be a futile endeavor. Even the exquisite forms of l'art pour l'art, and precisely these, still remain forms.

If one accepts this distinction of reference into self-reference and external reference, then the problem of reference poses itself on two levels. Reference itself is nothing but the achievement of an observational designation. Each observation designates something (traditionally speaking: it has an object). The opposite concept here is simply operating.[6] In contrast to referring, operating is an objectless enactment. In the observation, the difference between observation and operation can be reformulated in an innovative way as the distinction

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6.   We are leaving aside the complication in the text and note it only in the footnote: even observing is itself an operation; it therefore always enacts something that it is unable to distinguish and to designate, unable to "objectify," namely itself. We are calling to mind the thesis of the "blind spot" of all observation.

between self-reference and external reference. Self-reference refers to what the operation "observation" enacts. External reference refers to what is thereby excluded.

After these theoretical revisions, the predicate "real" can no longer simply be attributed, or (in the case of an error) denied, to what is designated. The value of reality shifts from the *designation* (reference) to the *distinction* that is co-actualized in every designation. Real is what is practiced as a distinction, what is taken apart by it, what is made visible and invisible by it: the world. And this holds for every distinction — for the distinction between self-reference and external reference as well as for the distinction between true and untrue.

The distinction between the problem of truth and the problem of reference thus leads to a distinction of distinctions, namely, to the distinction between the distinction true/untrue and the distinction self-reference/external reference. Both distinctions are located at a right angle to each other. They have no mutually unbalancing effects. That is, self-referential observations and descriptions, as well as those of external reference, can be both true and untrue. This takes away the Cartesian privilege of the subject. There is no truth preference for introspection. The insight remains valid that if self-observations and self-descriptions are enacted, they are enacted with a certainty lacking any criteria. This move, however, has only put the operation of observing (that is, its inability to see) beyond doubt. What it refers to (designates, objectifies, recognizes) can nonetheless be designated as both true and false — depending on the programs that serve as criteria for a correct classification of these values. Things remain the same: each system has a different access to itself than to its environment which it can only construct internally. Yet this advantage — and after Freud even theoreticians of consciousness ought to agree with this — cannot be interpreted in the sense that self-knowledge is easier to achieve, produces better results, or has a higher probability of truth than external knowledge.

For psychic systems, this state of affairs has been played through and laid open above all in modern literature.[7] Our topic, however, is the social system, and here the same facts are even more evident. The observing operation is always a communication that exposes itself already in its

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7.   Cf. for example Peter Bürger in collaboration with Christa Bürger, *Prosa der Moderne* (Frankfurt/Main: Suhrkamp, 1988); also Alois Hahn, "Das andere Ich: Selbstthematisierung bei Proust," *Marcel Proust: Geschmack und Neigung*, ed. Volker Kapp (Tübingen: Stauffenburg, 1989) 127-41.

enactment, and not only in its effects, to further observation. The question of whether it thematizes the communicating system itself (society itself) or something else is posed with the "form" of the system and is open to both options. Only the distinction as such is being enforced — simply by virtue of the fact that the system is operating. Self-reference as well as external reference can be encoded in one and the same code — and this encoding takes place in a different way, depending on which of its function-systems society uses. The same problem repeats itself at the level of function-systems, which themselves distinguish between self-reference and external reference in their operations. The modern pattern of the social system is articulated throughout the individual function-systems. In this way, the function-systems participate in the structural richness of modern society — a society which only they in turn put into this form.

Consequently, modern society's form of differentiation, the differentiation through functions, accounts for the need of descriptions that are rich in structure, and this need requires the distinction between problems of reference and problems of encoding as the distinction of distinctions. The semantic forms that take these requirements into account are specifically modern. They are historically conditioned both in their socio-structural cause and in their semantic expression. Only to the old thinking must such a "relativism" seem suspicious. The modern form of the self-description of society and its function-systems can integrate this factor. Indeed, it is unable to articulate itself differently; for in retrospect, premodernity has to appear to it as ontologically fixed and incapable of distinguishing between problems of reference and problems of encoding.

In constructivist epistemology, modern science has found the form in which it can reflect upon this state of affairs. One can describe this as an achievement of theory which, from Plato to Descartes, Locke, Hume, Kant, has described cognition in an increasingly radical way as a self-produced distance. This description creates the impression of a progress in knowledge which gradually yields an increasingly improved knowledge of knowledge [*Erkennen*]. This portrayal is not wrong. It is incomplete, however, and it does not allow us to comprehend the break between transcendental idealism and radical constructivism. Continuity is an indispensable prerequisite for every evolution, and the emergence of any new forms presupposes prior achievements, *preadaptive advances*, materials in which they can establish themselves. Equally important, however, is the recognition of abrupt discontinuities. In a mere historiography of

ideas, this side remains underexposed. A social-theoretical analysis explains discontinuities via the reorganization of the form of differentiation of society. The reason for the experience of modernity (in contrast to all older social formations) is therefore given with the functional differentiation of the presently realized social system. This form enforces a separation between problems of reference and problems of encoding. And this separation results in the semantic experiments associated with modernity.

The first implementation of this program via ideals of the future, transcendental-philosophical reflections, hopes of progress, and ideas of self-realization was insufficient, as the arts and literature already registered with disappointment in the nineteenth century. On the level of such an insufficient structural richness, one can today only formulate a theory of postmodernity or act out one's aversions to the factually supporting structures of our social system.[8] Since, however, modern society is, and continues to be, factually without alternatives, there is little sense in semantically resorting to irrelevance in such a way. If, on the other hand, one defines modern society structurally in terms of functional differentiation and derives from this principle its semantic requirements through such concepts as polycontexturality, second-order observation, and the distinction of distinctions — especially the distinction between problems of encoding (for example true/untrue) and problems of reference (self-reference and external reference) — then, in any case, an opportunity for observations and descriptions presents itself which is richer in structures.

That this, too, is only a communication, only a description, only a theory that exposes itself to observation, follows from the communication itself.

II

By an alternative route we also arrive at the insight that the specificity of modernity must be sought in the differences that are produced when an observer designates something and thereby makes a distinction. We infer this insight from the observation that important statements about modern science take the form of a critique that does not start from a perspective immanent to science with a view toward possible improvements

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8.   Cf. — at the beginning of the new excitement — Gotthard Günther, "Kritische Bemerkungen zur gegenwärtigen Wissenschaftstheorie: Aus Anlaß von Jürgen Habermas: 'Zur Logik der Sozialwissenschaften'," *Soziale Welt* 19 (1968): 328-41; repr. in Gotthard Günther, *Beiträge zur Grundlegung einer operationsfähigen Dialektik* vol. 2 (Hamburg: Meiner, 1979) 157-70.

but,inprinciple, complains about the fact that modern science, as science, leaves something essential out of consideration.

What is at stake in such a critique is the form of modern science — that is, the difference made by the fact that science exists. We are leaving aside the often heard complaint that science serves capitalism (and should rather serve socialism) because it is insufficiently articulated from the perspective of social theory. There is, however, another description of science, equally critical of modernity, that targets its center. It takes aim at a one-sided tendency toward formalization, idealization, technicalization, accounting, etc. In this sense, Edmund Husserl, as has already been discussed elsewhere,[9] spoke of a crisis of the modern sciences.[10] What is at stake here is not the dependency of technology on science but the dependency of science on technology — and not in the sense of a simple "finalizing debate" that only takes goals into account. At stake is the fact that science accepts technology as a form of its own. We are leaving open the question of whether anything is to be criticized, improved or avoided. We are only asking: in what sense is technicalization (we continue to use this word) a form? And if so, what is the other side of this form?

According to Husserl — and many have reiterated his view — technicalization forgets the "lifeworld," the always already employed, concrete foundation of meaning for subjective intentions, whether in the form of a naive "putting-into-it" [*Geradehineinstellung*] or of a reflexive attitude. Against this forgetting, Husserl reminds us of the special télos of European history: the complete self-realization of reason under the guidance of philosophy. Accordingly, the other side is the concrete actualization of meaningful human life under the guidance of reason. In a different version, which today is represented by Hans-Georg Gadamer,[11] the problem lies in our negligence of language (dialogue) and textuality (hermeneutics) as the prerequisites of all understanding.

But technicizing abstraction is itself a means of achieving and securing consensus, in disregard of everything that might lead to different paths; what is especially disregarded here is the concrete endowment of the individual human being with attitudes, interests, motives, preferences — in

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9. Cf. Niklas Luhmann, *Wissenschaft der Gesellschaft* chapter 4, sec. XV.

10. Edmund Husserl, The Crisis of European Sciences and Transcendental Phenomenology (Evanston: Northwestern UP) 1970.

11. Cf. in particular Hans-Georg Gadamer, "Text und Interpretation," *Gesammelte Werke* vol. 2 (Tübingen: Mohr, 1986) 330-60, especially 337f. Cf. also H.-G. Gadamer "Theorie, Technik, Praxis," *Kleine Schriften* vol. 4 (Tübingen: Mohr, 1977) 173-95.

short, the human being with a living memory. In the theory of the modern state, the confessional, legal, and moral judgments of individuals had to be regarded as arbitrary in order to make intelligible the necessity of concentrating such arbitrariness at the apex of the state.[12] Likewise, the concrete sense qualities and the entire sphere of "experience" [*Erfahrung*] and "opinion" in the realm of cognitive experience [*Erleben*] had to be understood as unreliable in order to set against them a mathematical calculus and its corresponding demonstrable measurement. This insight can still be garnered from the radicalism of Spencer Brown's *Laws of Form*: once one has made a distinction — and one cannot begin without one — and then continues in one's action, then an order of increased complexity arises, intelligible to everyone, which leaves only the options of either agreeing or the refusing to join in.

Consensus can only be achieved by reduction; or, in order to formulate it paradoxically, by relinquishing consensus. The Romans had already discovered in their own way that, in the case of a dispute, one had to pose the "*quaestio iuris*," define the legal problem, and, starting from there, search for similarities in the given law in order to separate the dispute from the network of kinship ties and political friendships. Nothing else is meant when we speak of differentiation in the terminology of systems theory. In exactly this sense, technicalization (or, to remind the reader, formalization, idealization, etc.) can be regarded as a specific element of modern science. A critique of this conception would be futile in a recognizable sense.

This in no way means that science has to confine itself to what is technically feasible, nor does it mean that science has to see its ultimate goal in technology, in the sense that freedom for thought experiments would be conceded only to preliminary reflections in accordance with the ultimate goal. Finally, it does not mean that now technologies on their part must conceive of themselves as applied sciences and, accordingly, wait until science is able to explain why something works. Such conceptions can be refuted with reference to the real situations. Scientific theories and technologies, however, converge in their use of simplifications — that is, simplifications in the sense of disregarding other things whose reality remains undisputed.

The understanding of technology as a simplification that works allows

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12.   Cf. Niklas Luhmann, "Staat und Staatsraison im Übergang von traditionaler Herrschaft zu moderner Politik," *Gesellschaftsstruktur und Semantik* vol. 3 (Frankfurt/ Main: Suhrkamp, 1989) 65-148 (70f.).

us to include the technology of money and book-keeping (concerning companies and nations in the most general sense). Accordingly, it becomes possible to balance the costs of labor and of materials. Indisputably, this process functions in the sense of calculating economically profitable or unprofitable modes of production in view of the question whether scientific discoveries are translatable into economic turnovers or not. It is equally indisputable that, in doing so, one abstracts from the evident fact that human beings work in a different sense than material. In other words, we are viewing as parallel the Marxian and the Husserlian critique of the disregard for what a human being is for himself. Obviously, modern society has made itself dependent on this abstraction, and for that very reason has left it to the individual to distance himself from this dependence and imagine his own most being [*sein Eigenstes*] as the center of the world — in a mode "free of technology," if one may say so.

Pitted against illusions that were perhaps indispensable at the beginning of the modern era, the understanding of technology as simplification means indeed not that the world even in its basic structures is simple and that this fact would have to be discovered. Science is not discovery but construction. Nor is it necessary to break through the surface of the phenomenal world and unmask it as mere appearance in order to discern the mathematical or categorical framework that carries the world. These are theories of the premodern world. On the contrary, science (just like, in its own way, technology) tries out simplifications, incorporates them into a given world, and seeks to determine whether the isolations necessary for such experiments are successful. Modern science can comprehend its own modernity only if it reflects upon this situation.

There are numerous ways in which this reflection can occur; in all cases, however, it requires double formulations. Systems theory speaks of differentiation by way of the operational closure of a system that is simultaneously *inclusive* and *exclusive*. In the language of Parson's *pattern variables* one can say that *universalization* can be achieved only through *specification*. This amounts to an avoidance of particularities, of concrete loyalties, for example, and of diffuse generalizations toward an all-encompassing indeterminacy. Yet another formulation succeeds if one aims at complexity. Then we must say that the construction of complexity can only be initiated by a *reduction of complexity*.

The modernity of all function-systems, including science, consists in the effects of these interrelated conditions. These effects block a

description of the world as an object given to (or "standing opposed to") the observer. Correspondingly, the problem of the unity of the difference between cognition and its object loses the classical significance it used to have in guiding reflection. Science can no longer comprehend itself as a representation of the world as it is, and must therefore retract its claim of instructing others about the world. It achieves an exploration of possible constructions that can be inscribed in the world and, in so doing, function as forms, that is, produce a difference.

Once we understand the crisis of modern science as a becoming-visible of its simplifications, its technical character, its functioning without any knowledge of the world, then it is conceivable that this insight could be channeled back into science, to a greater extent than has hitherto been the case, and become the object of normal research. Neither the critique of political economy nor phenomenology "as a rigorous science" have been able to accomplish this. Likewise, the thematization of "technology and science as ideology" failed to link up to normal research.[13] Only recently, indications abound that the costs of these — after all, inevitable — simplifications are becoming objects of scientific research. This holds, for instance, for the evaluation of the consequences of technology and, above all, for risk research. To begin with, these disciplines seem to be greatly restricted in their scope and are initiated and carried along by topical interests. At the same time, however, models of "autological" research of science on science have been developed at the margins of available theories of reflection concerning the scientific system. If we succeed in regrounding these theories of reflection to a greater extent on a constructivist foundation and in scientifically rehabilitating them with the help of suggestions from the quite heterogeneous "cognitive sciences," then even those topics traditionally relegated to a rather external critique of science could become topics of research. Science would continue to observe itself in terms of the schema of its own code, i.e., 'true' and 'false;' and it would still not think of thematizing the paradoxical nature of this code, that is, of asking whether the distinction of this code is itself a true or a false distinction. Yet it would be able to recognize to what extent it shares its peculiarities and its risks, along with all the characteristics we have discussed, with other function-systems, and to what extent it ultimately owes these peculiarities to the structures of modern society.

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13.   Cf. Jürgen Habermas, *Technik und Wissenschaft als "Ideologie"* (Frankfurt/Main: Suhrkamp, 1968).

III

A social theory that intends to take such considerations into account encounters a particular paradox, and this paradox arises to an equal extent for a description of society and for a description of the world. On the one hand, it is hard to dispute the fact that a comprehensive global social system [*Weltgesellschaftssystem*] has developed as the result of a long evolution. In addition, our concept of the world is not suited to perpetuating the old doctrine of the plurality of worlds; this doctrine has become inconceivable. Everything that is communicated is communicated in society. Everything that happens, occurs in the world. This, too, holds for observations and descriptions, no matter with what kind of authorship (subject, science, etc.) they wish to equip themselves. For this very reason, the unity of society (of the world) cannot be reintroduced into society (the world). It cannot be observed or described as a unity, especially not on the basis of a representation without competition or on the grounds of some didactic authority. For each observation and description requires a distinction for its own operation. The observation of the One within the One, however, would have to include what it excludes (that against which it distinguishes its designation). It would have to be enacted in the system (in the world), just as the distinction between self-reference and external reference is enacted in the system (in the world). Such an enactment is possible, and it gives its paradox the form of a *"re-entry,"* but the solution requires an imaginary space (as one speaks of imaginary numbers), and this imaginary space replaces the classical a priori of transcendental philosophy.[14]

The result can be explained further if one considers that each paradox can be unfolded in a non-logical (creative) fashion if one replaces it with a distinction. In our case, this would be the distinction between operation and observation (the distinction must take into consideration that all operations, if they are communications, are self-observing operations, and that all observations must be enacted as operations; otherwise, they do not take place at all). We can then say: the unity of the system is produced and reproduced *operatively*. The operation, at the same time, observes itself — yet it does not observe the unity which includes it, which comes into being, and is being changed, in this enactment. The *observation* of unity, in contrast, is a special operation in the system (in the world) which must

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14.   See again George Spencer Brown, *Laws of Form* (repr. New York: Julian, 1972) 56ff., 69ff. Cf. also Jacques Miermont, "Les conditions formelles de l'état autonome," *Revue international de systemic* 3 (1989): 295-314.

use a special distinction (for example the distinction between system and environment or the distinction between world and being-in-the-world) and which itself can also be observed in the process of its distinguishing and designating. The observation and description of unity from within unity is therefore possible, but only as an enactment of precisely this operation, only on the basis of the choice of a distinction whose own unity remains imaginary, and only in such a way that the operation 'observation' is itself exposed to observation.

We have thus reached the point where the significance of second-order observation becomes evident. In the architecture of theory, but also in the self-understanding of modernity, it takes the place formerly occupied by natural or transcendental premises. Instead of appealing to final units, one observes observations, one describes descriptions. At the second-order level, we arrive again at recursive interrelations and begin to search for "eigenvalues," which remain unchanged in the course of the system's operations. Perhaps these eigenvalues are only "places" occupied temporarily by values, with the consequence that after each change, these places must be re-filled because they cannot remain empty, a task for which there is only a very limited (or no) choice of other possibilities available. Put differently, they are perhaps only functions to be fulfilled while a very limited choice of functional equivalents is available. Thus one can say that research and therefore science fulfills a function and thereby reproduces a stable eigenvalue of modern society. One cannot simply refrain from research without triggering catastrophic consequences — catastrophe understood here as the reorientation towards other eigenvalues. It is therefore obvious that if one does not wish to flee into the imaginary space of an "other society," then the critique of research can only be carried out as research.

The observation of observations can pay particular attention to what kinds of distinctions the observed observer uses. It can ask itself what the observer is able to see with his distinctions and what he is not able to see. The observation of observations can be interested in the blind spot of its own use of distinctions or in the unity of its distinction as the condition of possibility of its observation. Here, the traditional interests of the critique of ideology and of therapy can be sustained, but only as secondary variants that are themselves exposed to observation by the question of why the second-order observer cultivates precisely this view instead of making use of other possibilities in the observation of latent conditions. At the level of second-order observation, society is able to operate in a

very general sense with the distinction manifest/latent, and indeed in such a way as to include, autologically, the second-order observer also. No one can see everything, and one gathers possibilities of observation only by engaging in distinctions that are functioning blindly at the moment of observation because they take the place of, and must hide, the unobservable unity of the world. Distinctions serve as two-sided forms that direct the operations of designating, referring, and connecting. They serve as the unity of the representability of conditions of their own possibility which themselves must remain invisible. And this circumstance helps us realize that the eigenvalues achieved thereby must assume the form of places or functions which "are" nothing but limitations for possible substitutions.

In the modern world, distinctions are therefore not, as it were, penultimate instruments that can be transcended with a view toward unity, whether of the world or only of absolute spirit. On the contrary, any attempt to designate a unity requires new distinctions and, in turn, renders the ultimate goal invisible. Knowledge — as, in a different way, art[15] — serves to render the world invisible as the *"unmarked state,"* a state that forms can only violate but not represent. Any other attempt must be content with paradoxical or tautological descriptions (which is meaningful as well).

A reflection upon this situation does not have to result in "nihilism," for such a conclusion would make sense only within an ontological frame of reference that presupposes the distinction between being and non-being. Nor are we dealing with a variation of the religious tradition that seeks support in the invisible in order to in turn lament the loss of this possibility today using the semantics of the invisible. Carrying along ultimate symbols [*Letztsymbol*] such as indescribability, invisibility, latency only reflects the contingency of the employment of all distinctions. The soundness of this reflection, however, arises — and this can still be ascertained by this reflection — from a form of social differentiation that no longer allows for any binding, authoritative representation of the world in the world or of society within society.

Translated by Kerstin Behnke

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15.   Here we have a problem of the distinction between science and art which Hegel in his lectures on aesthetics had to tackle as well. As we know, Hegel found a solution in the self-reflection of the distinction between the general and the particular. In our theoretical framework, one would have to take into account various ways of realizing (materializing, imagining) forms.