

## 15 Rationality

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### I

Any empirical investigation of what outsiders expect of organizations would probably show that they expect them to further their own interests or at least give due consideration to them. This is likely to be so for the individual outsider, whether applicant or affected party, customer or patient, school pupil or felon in prison. But it is also the case in relations between organizations - between firms and their banks, or between banks and firms seeking loans; or in relations between trade unions and companies or government; or in relations between hospitals and health insurance schemes. Since consideration of interests is difficult to specify, and since disappointing experience in individual cases cannot simply be generalized, a sort of trust develops on this basis; or at least mistrust strains relations to an almost unbearable degree, increasing the information and communication load - and is probably to be borne only when there is no alternative, and thus no market.

However, backcasting to interests leads to difficulties if, as is typical, the organization in question has to serve more than one interest. Interest in the given interest has to be extrapolated, so to speak, and a more general expression found. For example, the orientation on “interests” can be replaced by orientation on “problems.” Only in rare cases will impartiality be the formula chosen. Impartiality may well be expected from the courts but not from the trade unions. Even government should not decide impartially; after all, the concept of the public interest was invented to avoid this. The problem is therefore to find a concept that, while not ignoring interests - because that is what is at issue - leaves them unmentioned and incorporates them under a more formal heading. The job is done by “rationality.”<sup>1</sup>

Rationality abstracts from the evaluation of interests. It abstracts from *every* interest, for it would not be rational to give precedence to the public interest (or the common weal or the public good) over private interests. To express this, it suffices to stand up for the public interest with enthusiasm. But this is not an option for the state in the liberal understanding of the concept, let alone for organizations. Communicating at the level of the rationality concept requires

all evaluation of interests to be left aside, which naturally does not exclude interests from being recognized, acknowledged, and differently appraised. That organizations ought to decide rationally is accordingly the flag by which everyone (including the organization itself) can drape their expectations without having to identify with a particular interest. It is, so to speak, an equivalent in decision-making to what epistemology calls "objectivity." But what can rationality mean?

Perhaps it means only a form of communication that keeps the interests that are really meant in reserve; or a form of communication that reserves itself the right to express dissatisfaction and comes out with it as soon as it is clear what has been decided or what will be decided. The assertion of rationality would thus be a rhetorical act<sup>2</sup> to lend certain positions an air of incontestability. Or the term "contextual rationality" is used to express that rationality can mean different things depending on the circumstances.<sup>3</sup> At any rate, if anything determinable is meant at all, something else has to be excluded.<sup>4</sup> A form with another side to it has to be involved. But the question remains whether the other side is only the unmarked space of the indeterminable (so that everything determined would be rational as in the case of Hegel's absolute spirit, which has the work of the concept behind it and can be satisfied with itself), or whether one can and must specify what is excluded as irrational in order to treat the rest as rational – just as one can argue for a long time about taste but at best establish what bad taste is.

Since judgments about irrationality are made using the same criteria as judgments about rationality, irrationality cannot very well be regarded as the other side of the rationality form; it is only the negative version of the same form. Rationality as form differs from what "ethnomethodology" has described as "taking for granted." This tempts one to see rationality and culture or rationality and institution as opposites and to react to clear rationality deficits by calling for culture. If matters are observed as to their rationality (whether they are judged rational or irrational), a form is activated that cancels the normal assumption that the world is the way it is. This may well be attributable to an interest in change or an interest in legitimation. Be that as it may, the decisive, formative difference is in the cancellation of the "taking for granted," which naturally can take place only in the world and only in specific regards, while the world itself must always be taken as given *and therefore* (in keeping with our conceptual proposal) *cannot be taken to be rational*.

Judgments about rationality have to include the future. But the future is and remains unknown. The problem therefore shifts to a need for information.<sup>5</sup> Although information, too, can be taken only from the past, it can be selected in such a way that it offers conclusions (however unreliable) about the future. But this simply transfers the problem of rationality to a problem of information, and

in this context it not only takes the guise of information overload but is also more radical in that there is dependence on information at all.

As long as rationality remains indeterminable and recognizable only in the violation, this facilitates the self-description of the system as rational. The system calculates its identity by oscillating within the form of rationality. For sections of the world the assumption that things are the way they are is cancelled and replaced by schemata that enable oscillation between positive and negative. One does good by fighting evil and considers oneself healthy if no symptoms of illness manifest themselves. But as soon as structural characteristics are used as conditions or marks of rationality - and classical organization theory had attempted to do precisely this with characteristics like purposive orientation or hierarchy - oscillation shifts to other distinctions. For example, one can now ask about non-rational (informal, emotional, motivational) conditions of rationality; one can shift the problem of rationality to contextual conditions of rational action (trust, for instance), or move on to registering rationality damage. The organization theory of the twentieth century has trodden this path with great success, with the result that a distinction has to be drawn between the self-description of systems and the scientific analysis of the systems describing themselves. On the basis of this distinction and by means of second-order observation, one can recognize that even the mere *description* of structures and decisions as rational can be rational, *even if they deviate from reality and represent it highly selectively*.<sup>6</sup> The criteria of rationality thus take on a double meaning, depending on whether they relate to first-order observation or to second-order observation.

## II

Various distinctions are drawn in the general discussion on the concept and forms of rationality. Depending on the distinction taken as point of departure, different types of rationality result.<sup>7</sup> If it is the difference between means and ends, we have instrumental rationality. If it is the difference between facts and values, we speak of value rationality. If the starting point is the difference between system and environment, this gives us the concept of system rationality. To judge rationality, a distinction has apparently to be presupposed that in itself is not yet rational. Otherwise the evaluation of rationality would stick to given conditions.

The same applies for organization research. The classical model of organizational rationality was based on externalizations. Disorder (uncertainty, risk, etc.) therefore found its way into the organization only in moderate form. The small but acute minds of calculated rationality then had their chance. Essentially, problems appeared to have been solved in advance or, at any rate, a structure found that enabled rational processing. Organizations were

accordingly understood as instrumental, as purposive-rational, as tools serving the interests of those who had set them up for their own ends. This could be plausibly demonstrated by industrial enterprises or public authorities. Hierarchical super- and subordination was not an end in itself but a means to an end; and it was also the form in which difficult problems could be disposed of upwards and thus outwards. Public administration could define them as “political” problems and request its leadership to make decisions that were tenable or could at least be legitimated politically. Courts could clearly base unsatisfying decisions on the law and refer complainants to the lawmakers for a remedy. In the private sector, capital owners could be asked to decide in advance under what conditions and at what risk they were prepared to make capital available. And, vice versa, the organization assured those who provided needed help that it would make rational decisions. The difference between system and environment thus converged, at least in theory, with the difference between top and bottom and with that between problems that are easy and those that are difficult to define. Hierarchical control was considered an essential condition for the rationality of a broadly ramified operational context.

This was associated with implicit assumptions about the system of society that used organizations to perform specific tasks. Society had to be seen as a sufficiently ordered system if it was to answer the questions organizations addressed to it. This task had previously been assigned to the market or to the democratic processes of politics. It is now often described as a requirement of institutions, and in this regard we can think of the state, of property, of sufficient consensus about the educational canon in schools, or of the professional ethos of doctors, for instance, or of the limits to reasonable attention. Organizations could hope to hear nothing more about the matter if they “externalized” problems. And it was not only other organizations that stepped in with their own decisions, such as courts to settle legal matters or banks to provide additional loans; society itself was assumed to be so ordered that in organizations, too, a framework for determining decision premises could be taken as given.

This provision of support by an external order and by externally imposed restrictions has become progressively less plausible. For the self-description of societal functional systems and for the reconceptualization of the individual as subject, the relevant changes set in as long ago as the eighteenth century. The traditional supportive world formulas (harmony, the hierarchy of being, *analogia entis*, perfection in diversity, *concordia discors*, etc.) have lost their credibility. They have come to grief because of antinomies; they have produced a multiplicity of discrepant world descriptions, and finally an infinite concept of the world, which can be broached by various observers with various distinctions. As a result, every system has to distinguish and process self-reference and other-reference in its own way,<sup>8</sup> so that descriptions can no longer converge; instead,

one is referred to the observation of observers if one wishes to discover what reality is and for whom.

If this has been European knowledge at the level of the concept of the world and theory of society for two hundred years, how was it possible at the level of organization theory for the notion of an exogenous instrumental rationality to persist until recently? How could the existence of a fixed environment be assumed in relation to which an organization could adapt? Or if the environment is taken to be turbulent, how could an instrumental concept of rationality persist? How can one, even now, assume that the solution to the rationality problem lies in contextual or institutional conditions? To put it still another way, how could one cling to an asymmetrical or market-type relationship between organizational systems and societal environments when it is perfectly clear that no functional system in society can maintain its level of performance without organization (government and political parties, manufacturing plants and banks; courts, hospitals, schools, and so forth)? In other words, circular relations between organizational systems and the societal environment have to be assumed. This is true even if the circle, for example, in the case of the many markets of the economic system, is so large that from the perspective of the individual organization it appears to be a straight line or a relationship between independent and dependent variables; or, as in so-called contingency theory, if one has to assume that the rationality of an organization lies precisely in being geared to an environment that does not operate rationally.

The classical theory of rationality had clearly survived so long because it succeeded in representing and satisfying an interest in *corrective critique*. Or this at least appeared to be the case, above all in the organization of production processes. The organization and the people employed in it were demanded to operate constantly at the limits of their possibilities or otherwise face criticism designed to improve matters.<sup>9</sup> Meanwhile, however, at least organizational sociology (but not the literature that recommends management concepts) has abandoned this notion. Leading figures are James March and Karl Weick or in decision theory, Daniel Kahneman and Amos Tversky. An empirical science cannot simply ignore the fact that decision-makers in general and managers in particular are not guided by the rules put forward by models of rational decision-making. There is simply not enough time in everyday working life. The notion of rationality continues to play a role; but more recent theory is interested rather in understanding why and how things can work without rationality. Older criticism of rationality weaknesses has been replaced by astonishment at how organizations put up with themselves and how this can preserve their own decision-making capacity without being able to guarantee it through rational decision-making. The subversion of rationality raises the question of intelligent behavior that can take account of these conditions.<sup>10</sup> The answer can be sought at the behaviorist level of describing actual

behavior.<sup>11</sup> However, a theoretical framework for this purpose appears to be provided only by recent reflections on a general theory of self-referential systems, from which the preceding chapters have benefited.

Within rationalistic organization theories, too, there was room for counter-concepts, which, however, remained undefined. For example, experience and skill in handling conditions were appreciated, and this provided not least an argument for the older generation against the younger, or also a way to reject proposals that are "not acceptable here." Only if the temporal relations, recursivity, and uncertainty absorption in decision-making processes are taken more strongly into account can these requirements be described more exactly. What is at issue is the ability to adapt in experience and action to constantly changing situations with ever new pasts and ever new futures.<sup>12</sup> This includes adaptation to the social interdependence of preferences, thus also willingness to change one's own preferences. If rationality is to include these requirements, it can be seen neither as a long chain of means and ends nor as clinging to particular preferences. In day-to-day operations, ideologies then emerge that are honored in communication (also as ideologies of the other side) but that scarcely influence events. An observer intent on getting to the bottom of such behavior is left only the possibility of describing demands and behavior as paradoxical.<sup>13</sup>

Theoretical reflection now appears to react to such critical experience with rationality by taking the time dimension more strongly into account.

The unknownness of the future continues to be a source of difficulty and of differences of opinion in the decision-making process. But it is naturally also a condition for making decisions at all. And if the wrong decision has been taken, it allows corrections to be made. And all planning of decisions can provide for further decisions to be necessary and possible at later points in time. From this point of view, time, and in particular the unknownness of the future, replaces fixed goals and premises, which more than ever before can be left to controversial assessment and provisional agreement.

How the theory of self-referential systems reacts to this challenge is traced out by the concept of autopoiesis. Autopoietic systems, and hence organizational systems, distinguish themselves from the environment by setting up and maintaining a recursive reproduction context. They themselves regulate relations between self-reference and other-reference in the observation of their operations. They generate new situations of restriction and opportunity, of certainty and uncertainty. But it naturally cannot be said that autopoiesis is itself rational. This would render a concept of rationality superfluous and reduce us to the idea that reality itself is rational. But if this answer is not accepted and one must also focus the concept of rationality on a given society, how are we to understand the rhetoric of the rationality of autopoietic organizations?

## III

Before we go into this question, we must take a long detour in an attempt to explain the relationship between rationality and causality. Theory had distinguished between logical and empirical issues and been satisfied with this distinction. From a logical point of view, the issue was consistency as a logical requirement for connectivity. From an empirical point of view, it was causality as an empirical requirement for connectivity. However, this already takes us beyond the extant discussion, makes sense only in retrospect, and raises the question of why this distinction has to be made and not another.

With the paradox problem and with Gödel, logic has brought its own difficulties to light. Corresponding reflection on the concept of causality is still outstanding.

Causality can be said to present an infinite horizon of ever new causes and a second infinite horizon of ever new effects. In this horizon every cause is also an effect and vice versa. For this reason specific causes have to be ascribed to specific effects. This presupposes a logical separation of causes from effects and can take place only selectively, only by ignoring other causes and other effects. Every causal proposition therefore remains relative to an observer, who attributes thus and not otherwise, and this requires greater or lesser consensus and a greater or lesser guarantee for repeatability.<sup>14</sup>

It always has to do with reductions, with forms of simplified attribution. This has to be taken into consideration if the importance of the cybernetic revolutionization of systems theory is to be assessed. It is concerned with attribution to structures, not to events. Whereas attribution to constant characteristics (a knife cuts because it is sharp) had earlier been usual (and in an everyday understanding still is), cybernetics proposes attribution to circular, self-correcting mechanisms. To begin with, this looked like a return to teleological causality.<sup>15</sup> In fact, however, only a structure was presented that explains why it looks as if the system pursues purposes. There is therefore a switch from the attribution of purpose to the attribution of structure. This led to the suggestion of building such self-correcting reflection loops into systems (e.g., in computers) to enable states or performances to be attained under changeable environmental conditions. What is concerned is thus a form of attribution that can be set up, hence a use of causality in two steps. It is about simplifying attribution that abstracts from concrete events, and thus from time. And it is about handling a problem that presupposes the difference between system and environment. The "rationality" of cybernetic arrangements always refers to this difference, and is therefore always system rationality.

If the theory of autopoietic systems is also introduced, then it is obvious to posit that attribution takes place primarily with regard to the system's own autopoiesis. This depends on both internal and external causes.<sup>16</sup> The system

will therefore orient its attribution on this difference and arrange the cause/effect constellation to which it pays heed primarily around its own operations, around the freely chosen, internally available employment of causes. Although this is not prescribed by the world as it is, decisions are imagined to be made through actions, and that this has effects that would not occur without decision/action. What is then important is discovering the causes that enable meaningful decision/action and what effects they will have. This consequently implies a minimum of self-attribution and corresponding risk, even if the system can always shift attribution to the environment (if, for example, blame is to be placed or accounts rendered). In the causal schema, as elsewhere, the system can oscillate between self-attribution and other-attribution. Some already call this autonomy and therefore speak of relative autonomy.

The conclusion is that the distinction between causes and effects cannot be brought into line with that between system and environment. The two distinctions are logically independent of one another, are at right angles to one another, even if each system tends to make itself particularly important, indeed indispensable in the causalities it has constructed. We could almost say that the difference between causes and effects neutralizes the distinction between system and environment. If systems are included, the causal schema can be applied only if both causes and effects can occur in both the system and its environment. This finds expression, for instance, in the concept of production or reproduction (production from products) - in contrast to what since theological times has been described as "creation" (*creatio*).

But this does not yet bring us to the heart of the problem. We have seen that the distinction between causes and effects separates *two* infinite horizons and thus produces an attribution problem. We can also say that, in the *medium* of causality, *forms* always have to be produced that reduce the endless variety of possible combinations to one; and we also understand that this requires *time*, so that the form passes and new forms become possible if the cause has had an effect. The medium itself remains invisible; but it regenerates itself in observation through a continuous change of forms in which it becomes reality and does its work.

Like every distinction, this raises the question of the unity of the difference. In other words, what is meant by the effectiveness that is posited in the production of effects by causes? This problem is normally put in the form of an explanatory question: How do we explain that certain causes produce certain effects? The explanation is then given in terms of empirically verified causal laws or, if one cannot proceed so strictly, then in terms of empirically tested, statistical probabilities. But this answer misses the point of our question. It presupposes switching the problem to the question of the form of causal explanation, tacitly adopting an ontological concept of the world: there is causality in the world, and cognition can form right or wrong ideas about it.

But such information has been rendered questionable by the attribution theory now held in high esteem. It can be saved only if one relativizes the importance of attribution. A certain scope is seen for system-specific attribution; but in many cases reality shows through. The choice is not between attributing water on the street to rain or not but only between ascribing an aquaplaning accident to excessive speed or to rain.

Once again we have lost sight of the unity of the difference and have instead discussed how to deal practically with causal problems in the life-world. What unites the distinction here, too, is only the observer himself, or, to be more exact, the operation of observing at the moment in which it is carried out. Causality is attribution, but attribution through a recursive system that needs indications and, above all, a memory if it is to cognize. Coupling certain causes with certain effects thus stabilizes distinctions to which one can return if need be.<sup>17</sup> And even if errors are realized and causal explanations or causal plans have to be modified, this requires resorting to distinctions that have partly proved their worth and partly not.

It amounts to the same if, using Gotthard Günther's terminology, we say that causality is based on a transjunctional operation, which in the given present selects one differentiation schema and not another to construct its own operations or calculate its own behavior. For organizational systems this would mean that causality is the decision that produces a connection between causes and effects, thus using the medium of causality to give it a form that leaves open how the decision observes for its part and is used to construct other causalities. The decision is a mystery to itself, at any rate not a cause that, like the old *mechane*, must cunningly penetrate a cosmological causal web to turn something to its advantage. It is the operation that couples, and only by doing so does it make causes into causes and effects into effects in the given infinite horizons of the "and-so-on." But this does not exclude another observer (who can be the decision-maker himself) construing the decision as a cause without which its effect would not occur. But it should not be forgotten that the causes of the decision, too, would not have become causes without the decision.<sup>18</sup> From the point of view of the causal schema (and not, for example, from an expressive or ethics of conviction perspective), the decision is curiously ambivalent: it can be seen as the cause for a causal relation existing at all between its causes and its effects. On the one side of the cause/effect distinction we then find it as both cause and actualization of this distinction. This ambivalence conceals a paradox, which would become apparent if one permitted the question whether attribution is not the real cause, the primal cause of what it construes as a relationship of cause and effect.

In the ambivalence of decision causality, we thus discover the paradox of time - in schematized and hence credible form. The decision brings infinite cause and effect relations together in one point, namely in itself. It lets causality

take place simultaneously with itself, although the causal chains point back far into the past (but are only now rendered effective) and the effect chains lie in the future (but are already caused). This striking simultaneity of temporally distant (at the moment non-actual) causes and effects is a variant of the simultaneity of time itself, that is to say, of the observation that past and future can be distinguished only in relation to a present and ultimately (if the observation of observations is also taken into account) in the present. For practical purposes and for the practical concept of rationality, this means that a control illusion comes into play,<sup>19</sup> which gives the impression that a vast number of causal factors can now be drawn on in distribution to causes and effects. And indeed, it is up to the decision to produce causality without being able to produce the necessary causes and the ensuing effects; for only if the coupling succeeds do causes become causes and effects become effects. As long as notions about the quality of decisions under the “rationality” heading are oriented on the causal schema, interfering residues have to be reckoned with - like the “corruption” of natural perfection in the old world of teleology. But, as regards the state of the world resulting from historical determination, this is handled under the category of error, and, as regards the costs of allowed-for effects, with the concept of side effects or possibly that of risk. For the theory of economic decision-making, it then seems as if decisions can be made about revenue and expense, costs, benefits and risks, advantages and disadvantages *at the same time*. With the same control illusion, politics confirms to itself that it has the power to shape society and can justify the use of this power. It is the same with education science when it inculcates the courage to educate into the teachers it trains and provides the corresponding, professionally validated self-descriptions.

The logic of such control illusions (not to say their rationality) is easier to understand if we relate them to the demand of decision-making in organized positions. The traditional theories of the “prudentia” of the practitioner had drawn his attention more to favorable opportunities, to the right point in time, to good luck, to the favor of the gods.<sup>20</sup> And the problem here had been that unintelligible links between past and future events (forms of being remaining constant) had to be reckoned with and also with immoral behavior on the part of opponents (vice and virtue catalogues remaining constant). Modern society, however, has done away with the framework conditions for these recommendations, even though their practical reasonableness may now and again still be plausible. Although organized decision-making on the basis of decision premises can also be opportunistic, and is then described as “adhocracy,” superstition, too, can be useful as a sort of random mechanism for preventing the worst. But when rationality is at issue, the answer cannot very well be: sometimes this way, sometimes that.

If one nevertheless insists on a concept of rationality that relies on causality that is aim-driven and instrumentalist, it will be increasingly contradicted by experience. The illusory components, which had hitherto been successfully suppressed or marginalized or simply ignored in normative models of rational decision-making, come to the fore and demand attention - increasingly so as the importance for modern society of the organization as a form of system becomes a subject of debate. Famous names in organization research such as James March or Karl Weick owe their reputation to their efforts to put head-standing classical rationality premises on their feet. James March appears to recommend a "technology of foolishness."<sup>21</sup> And Karl Weick lists the following criteria for effective organizations: they are (1) garrulous, (2) clumsy, (3) superstitious, (4) hypocritical, (5) monstrous, (6) octopoid, (7) wandering, and (8) grouchy.<sup>22</sup> Nils Brunsson calls for a distinction to be drawn between talk and action, between decision rationality and action rationality, thus dissolving the unity of classical rationality ambitions without replacing it.<sup>23</sup> Others stress that an organization can gear itself to change only through "self-designing," and this requires as little as possible of all things bright and beautiful: consensus needs to be minimized; rationality, consistence, faith in goals, etc. need to be kept at a low level; and only small surpluses should be run (in order to gain "more").<sup>24</sup> A recent habilitation thesis treats organization as the production of garbage,<sup>25</sup> and there is indeed much to be said for no longer measuring the organization in terms of its goals but in terms of its effects on its ecological and human environment. From a dynamic perspective, setting a decision premise would have to be treated as a debt owed to the world, which has to be paid back under unforeseeable conditions. Then, as the concept of autopoiesis teaches us, the relationship with the environment can no longer be described as "adaptation." However, it is striking that none of these attempts at re-orientation claim or could claim to formulate a new perspective for insiders. They therefore have nothing to do with a new concept of rationality able to take account of the insight level offered by the theory of self-referential systems. Although, like Tartarin de Tarascon in his cabin, one hears hectic and contradictory commands being given, aft, forward, and frantic running around on deck seeming to signal that the ship is sinking, the next chapter reveals that "*on ne semblaît pas, on arrivait.*"<sup>26</sup>

#### IV

Setting out from the paradox of observation or the paradox of form offers a way out.<sup>27</sup> In organization theory itself, there are signs that forms of paradoxical communication are attracting increasing attention.<sup>28</sup> This branch of organization studies realizes that communication in organizations (as in families) often involves reference to contradictory matters and, above all, to opposing opinions,

the articulation of which is effectively suppressed. From the point of view of participants, this looks like designed inconsistency, which, however, has to be treated consistently as incommunicable.<sup>29</sup> Controversies on theory are also treated as resolved paradoxes: one accepts the one side of the paradox as correct theory and denies any justification to the other side. But this theory of paradoxical communication then speaks for itself without reflection on the paradox it contains. It promises that paradoxical communication will trigger creativity and considers the promotion of creativity to be a good thing.<sup>30</sup> However, this is at best half the truth and lacks empirical underpinning. Thus, the alleged relationship between paradoxical communication and creative innovation is merely evidence of the still prevailing idea that an organization should and can operate rationally, and, should the need arise, can do so through the instrumental use of paradoxical communication. More radical problematization would require examining whether the assertion of rationality or creativity is not itself a paradoxical communication because it conceals and renders incommunicable the fact that an organization cannot operate rationally at all and that creativity can prove very harmful.

This is likely to be achieved only if theory switches in principle (!) from principles to paradoxes.<sup>31</sup> This has already been initiated with the switch from input/output models to autopoiesis. But the problem of paradox must correspondingly be formulated more radically, on the lines of: every beginning is paradoxical.

We had already referred to this as the paradox of observation or paradox of form. In order to indicate something, every observer has to distinguish what is indicated from what is not. He therefore relies on a distinction, but uses only one side of it, leaving the other unmarked. If he wishes to cross to the other side, he has to indicate it - once again in distinction to the other side. In such observation practices, the unity of the distinction - and thus also of the observer who draws the distinction - remains unobserved. One can also indicate a distinction. One then establishes a form - for instance, the form of the sign that is distinct from what is signified,<sup>32</sup> or the form of the system, which is distinct from its environment. If the observer indicates a form, and always a specific form and not another, he selects a unit with two sides to it. He knows that the operations of further observation have to set out from the inner side and not from the outer side of the form. The observation of a form is thus always observation of an asymmetry. In order to see the form, one must accordingly see a boundary and also observe the inclusion of exclusion. But then the observation of a form requires indication of a distinction determined by it - a specific distinction and not any other, for instance the form system (and not environment), or the form good (and not bad).

And if observation is involved (and how else could we approach the concept of rationality?), there is therefore always a paradox involved. This paradox can

go under various names, depending on what one is concerned with - for example, identity of the difference; unity of differentiation; invisibility as the condition of visibility. But all observation gives the paradox an asymmetrical form, thus breaching symmetry or de-tautologizing matters. In other words, observing is the unfolding of a paradox, the substitution of an operational distinction, which (and "operational" means nothing else in this context) amount to a distinction between the inner side and the outer side or between positive and negative.

If one chooses this approach, one goes back beyond the traditional distinction between logical consistency and empirical-causal purposiveness, depriving it of the rank of a primary distinction that directs all others. Efforts to obtain logical consistency that necessarily excludes or ignores paradoxes are replaced by a calculus of forms that falls rather in the domain of mathematics.<sup>33</sup> It is about developing complexity in dependence on the choice of a distinction; and this is termed calculus because, owing to the formal structure of the arrangement, everyone who follows it has to agree (insofar as errors do not occur, which can be corrected). What appears to be a paradox and what can be resolved in the calculus depends on the complexity of the system state attained (e.g., on whether second-order functions, imaginary numbers, or imaginary spaces are permitted). In Spencer-Brown's calculus of forms, this problem focuses on the figure of the reentry of a form into itself, thus of a distinction into what is distinguished.<sup>34</sup>

In the field of empirical research that makes use of the causal schema, we have already discovered a corresponding figure, namely the question whether one can regard the attribution of effects to causes as a cause, and thus reenter it into the causal schema. At first glance this is a highly irritating procedure; but it could be that mathematics can offer us at least some ideas about what would happen if this happened, or how a system has to be equipped to afford such a reentry. The same thought comes to bear if we treat the concept of system as an empirical one and then ask how an actually operating system can reenter the difference between system and environment, which it produces itself and to whose reproduction it owes its existence, into this same system. This is a quite usual process. We had repeatedly noted that organizations, like other social systems, orient their own operations on the distinction between self-reference and other-reference. This is nothing other than a reentry of the difference between system and environment into the system. The function of this figure in paradox resolution is apparent in the fact that the system renders itself invisible in carrying out this function, and consequently does not distinguish between the environment that it indicates and the environment "out there" that could be observed by other observers. A fusion takes place.<sup>35</sup> The reentry also conceals the paradox that could be discovered if one asked whether a distinction remains *the same* if it reenters *into itself*.

This brings us to the heart of the problem. If rationality is to address demands to an observer, the problem of system rationality could lie in handling the distinction between self-reference and other-reference (this could then easily be transferred to other distinctions: in decision-making it would involve the distinction between the decision before the decision and the decision after the decision, thus the problem of risk; in observations oriented on causality, it would be about the problem of taking attribution into account; in the case of observing itself it would be a question of second-order observation, of the observations of observers, etc.). And it would always have to be remembered that the sole "substratum" of rationality is the only momentarily actual operation, which has to actualize demands made of itself through recursion.

When it is a question of system rationality, then, how can one assume indifference toward the environment while at the same time treating it as a variable? How can one maintain operational closure and nevertheless permit greater account to be taken of the environment; and not only of the environment as it is "out there" and "is" operationally inaccessible (whatever that means), but of the environment as construed in the system itself on the basis of operationally connective distinctions? How can the system organize its internal structures in such a way that it can generate more irritability without this ending in confusion, hence without the conversion of irritation into information being hampered or costing too much effort?

Normally, the system does not distinguish between what it calls the environment and the environment as it is. For the system, the two have a single cognitive status: reality. At best, second-order observers can say: "We can never be quite clear whether we are referring to the world as it is or to the world as we see it."<sup>36</sup> To get closer to what we want to call rationality in this context, the system has self-correction mechanisms at its disposition. It tries to recognize and avoid "errors." This is still within the classical realm of truth rationality and can be handled with the usual two-valued logic. More demanding procedures could try to recognize and avoid self-referential "projections." Self-correction mechanisms are developed into self-accusation mechanisms. The system then observes itself with the aid of the distinction between normal and pathological. As it were, it psychiatrizes itself, often with the help of advisers, to establish whether its own structures (programs, interests, and above all, naturally: organizational culture) lead to a distorted perception of reality. But even then, the assumption remains that one can gear oneself to the reality of the world as it really is. A "radical constructivism" may be convincing as theory, but in practical terms it is unattainable. Taken seriously, it would mean that other-reference, too, is only self-reference and would thus allow this distinction to collapse in its own paradox.

Nevertheless, this rationality concept of seen-through reentry may be useful, and precisely because it draws attention to a paradox. The distinction (in this

case between system and environment) that reenters itself is the same and not the same. The “reality” is always given only as indicated reality, thus only thanks to referential observation, but it is not only reference. This at least implies that the system can carefully generalize its projection awareness, can normalize its self-psychiatrization, and can hence be self-critical in a strict sense of the term while keeping its feet on the ground of reality. It can use it to feel its way carefully ahead without the illusion that the right location, the natural telos of the movement can be reached.

That no boundaries set by nature or logic have to be respected - except the very remote material limits for information processing - permits open perspectives. Although, as we know,<sup>37</sup> evolution punishes almost every specification as restricting further evolutionary potential, there are exceptions. The invention of the system type organization, and thus, roughly, the procurement of flexible, both specifiable and modifiable motivation in return for remuneration is already an impressive example of the possibility for social systems to gain structural complexity in the relationship between self-reference and other-reference. This development does not have to be regarded as over. Although disappointment with the traditional expectations of rationality is currently predominant - no optimal solutions to problems, no consistency and no temporal stability of preferences, no reliability in linear, longer-term causal plans - this type of disappointment need not give rise to resignation; it could be countered by switching expectations to a different concept of rationality.

Above all, durable notions of rightness on the lines of “once right, always right” will have to be abandoned. Complexity at the level demanded requires complexity to be temporalized. Every later decision “re-describes” preceding decisions, thus remaining within the system while creating scope for its own contingency and thus for its own decidability.<sup>38</sup> If a reentry is to be made possible in such a redescriptive process (and it is always introduced, since no organization manages without self-reference and other-reference), time becomes the decisive variable, taken into account in all operations - in this case in all decisions. The operations of the system are structurally determined and autopoietic; it can only produce itself. However, it has no corresponding capacity for self-observation, for this would mean multiplying every operation by its distinctions; thus not only to let them happen but also to register what does not happen while it happens. It is therefore precisely complete self-determination that produces a discrepancy between operation and observation that increases with growing complexity. It now appears that the resulting “unresolvable indeterminacy”<sup>39</sup> is compensated for by the distinction between self-reference and other-reference and by the inclusion of time. In relation to the past, the system needs memory, that is to say, the capacity actualized in the present to remember *and to forget*. In relation to the future, the system has to gear itself to oscillation, for example, to oscillation between knowledge and

non-knowledge, or between transparent and opaque objects, to oscillation between code values, thus between decisions judged good and bad; and not least to oscillation between focal points in the field of self-reference and in that of other-reference, which are both given only in infinite horizons of unceasingly possible exploration.

If one has to rely on memory, one can fall victim to self-created simplifications.<sup>40</sup> For example, one reckons with a situation, takes something to be unique and forgets it, and can then no longer recognize that it repeats itself. Or states of affairs one recalls are considered to be still relevant even though environmental conditions have changed.<sup>41</sup> Or adjustments have to be made to an oscillated future determined by various bifurcations, a future whose course cannot be foreseen or deduced from what one knows. In the social dimension, this gives rise to agreement without consensus, without strong commitment, without motivation to persevere. Willingness can then be expected only in the form of irrationality.<sup>42</sup>

Such a concept of rationality must breach the hitherto assumed link between rationality and forecastability. This applies for both external and internal forecasts. What is called forecast is then rather a tool that points out what has to be changed in the forecast if, as typically occurs, it proves inaccurate. Forecasts are, as it were, memoirs, which remind the system of how the future had looked and how it had been motivated by it - memoirs that have to be continually revised to take account of what one needs at the moment in the way of future in order to decide. In other words, they offer possibilities to observe problems and changes more closely (at the risk of failing to see other things) than would have been possible without memory.

## V

There is no cosmological justification for such a concept of system rationality. It cannot be explained by the nature of things. And putting it under the heading of "reason" would be going too far, if by reason we mean that the individual potential for subjectively convincing sensemaking is to be exhausted and everything that does not satisfy this wish is to be disqualified as merely technical rationality.<sup>43</sup> Even if the "subject" is exchanged for society, such extrapolation from organizational rationality to societal rationality will not work. The systems differ too greatly in the nature of their autopoiesis. What can be achieved in the way of rationality by a system that communicates on the operational basis of decisions cannot, for this reason alone, claim the title of macro-societal rationality - not even if in both cases only system rationality is under consideration and the more far-reaching ambitions of Jürgen Habermas's theory of communicative action are left aside.

Instead of insisting on overall rationality and regarded it a norm to be prescribed and implemented, we ask how organizational rationality affects the societal system that relies on it but cannot identify with it. In addition to what has been said in Chapter 13, we limit ourselves to three aspects without claiming to exhaust the subject.

If all organizations owe their flexible specification to the payment of wages and salaries, this means that all organizations also operate in the economic system regardless of whether the focus of their function lies in this system or in other functional systems, for example, in the case of governmental organizations in the political system, in the case of schools in the education system, in that of courts in the legal system, or for research organizations in the science system. Every organization that spends money has to ensure that money comes in. This gives particular importance to the economic system, which alone can provide money and, especially, ensure the willingness to accept money;<sup>44</sup> and in this connection, since not all organizations can refinance themselves economically through their products, the state has to intervene by coercive means, using political resources. This leads to optical distortions, as it were, namely to the idea that in modern society the economy and, in conjunction with it, politics have functional primacy, with other functional systems playing at best a secondary role.<sup>45</sup> However, if one keeps in mind the importance of failure or malfunctioning, this view soon has to be corrected: politics without law and without mass media, economy without education in schools? This does not necessarily mean that all functional systems are equally important for the further evolution of society, but at any rate the relative prominence of systems cannot be judged solely at the level of the organization. Precisely the weak performance currently evident in politics as organized by the state and in an economy dependent on borrowing and steered by the financial markets should serve as a warning.

At least - and this is the next aspect - the extent to which modern society has made the distribution of access to the satisfaction of economic needs and, in this connection, the financing of the welfare state dependent on organized work and on nonwage labor costs gives food for thought. At the level of organizations, a trend would be expected toward rationalizing away costly work where possible or outsourcing to low-wage countries. On the other hand, society cannot do without the distribution tool of (organized) work. Under the name of "work," organization is one of the key problems of modern society. Worries about the "future of work" had been a first storm cloud to loom over the left-wing scene of the 1970s, and not there alone. However much the economy may impose economic management on organizations and however much organizations that are not primarily economic orient themselves on market-type demand, greater efforts have to be made to make more out of work by specifically organizational means.

Another remark follows from the assumption that organizational rationality in social relations requires agreement without consensus. All absorption of uncertainty is only temporarily valid, anyway; it involves remembering the guiding aspects of decisions, and can be called into question if things change. So why get worked up? The decisions that ultimately determine the course of events come about through collective thinking, even if certain contributions, ideas, and even obstructions can be attributed to individuals. Seen from the outside, the system works anonymously anyway, and if names are named, it is display for publicity purposes, allowing no conclusions about specific decisions - as at least insiders are aware.

If at all, society must therefore provide other terrain for the communication of individual identity. In the nineteenth century it had been assumed that this could be private life, love relations, and the family who share all burdens and appreciate the individual whatever the world grants or denies him.<sup>46</sup> Under present-day conditions, we find at best public rhetoric recommending the family as societal remedy, but hardly any reality that provides such service. This may well be because this solution had systematically disadvantaged women; or also because it could work only as long as the stratification of families came to bear as a supplementary factor. This cannot adequately satisfy the need for an identity that can be communicated as being voluntary and stubbornly upheld. The mass media supplement this by presenting heroes and heroines as identification figures.<sup>47</sup> But this has now been added to by quite different possibilities of public communicating resolute, not to be discouraged, uncompromising identity. Above all in prosperous parts of the world, there are protest movements pursuing widely differing, constantly updated causes;<sup>48</sup> and then there are ethnic, religious, and also thematic fundamentalisms of various sorts.<sup>49</sup>

It could be that opportunities or new sorts of organization arise - just as social work has to do with problems that other organizations leave unresolved behind them. What is striking about social movements is their fluctuating membership, their dependence on specific generations, and the tendency of their leadership to switch to other, more normal organizations when the opportunity arises. We merely note that society cannot be understood as the sum total of organizable work but that its dependence on rationally organized work is reflected in its reacting to problems to which organizations contribute as the other side of their form.

## VI

An external observer, a sociologist, or an organizational consultant can observe that and how organizations observe themselves. He can analyze their explicit and implicit texts and draw conclusions about self-descriptions. The theory of

autopoietic, operationally closed systems also says that that such self-observations and self-descriptions are to be expected. Since such systems are dynamic and react to themselves, it can also be expected that self-descriptions will not remain constant but will change, with or without the help of researchers. We had looked at such changes with regard to hierarchy and rationality. Although hierarchy continues to be used without dispute as a structure, it no longer appears to be the sensemaking center of organization descriptions. And even more clearly: although ends continue to be pursued, the optimization of ends/means relations no longer appears to be the ideal of self-description as rational; or where it is maintained, the supposedly irrational components of the organized decision-making process come more strongly to bear.

Although this analysis understands organizations as observers, it treats them as first-order observers. They relate to themselves as to objects. They measure themselves against the requirements that they presuppose. In all this, variability is built in and criteria of unconditional, *a priori* rightness are done without. The society often described as "postmodern" discourages abiding by such absolute criteria, describing this as "fundamentalist." In these cases, one cannot yet speak of second-order observation in the strict sense.<sup>50</sup>

We therefore have to distinguish between two concepts of autonomy. The *operational* closure of autopoietic systems does not imply a *cognitive* closure of such systems at the level of observation. This would presuppose that,

with respect to everything that they observe in relation to themselves or in relation to their environment, the systems also observe that it is they (and only they) that choose and use the observation schema. This amounts to the practical acceptance of the radical-constructivist thesis. If, for example, a distinction is drawn between decision premises and decisions, it must remain open whether any discrepancies, errors, or deviations are attributable to decisions or to their premises. As far as the conditions of rationality are concerned, whether rationality deficits are to be attributed to decisions or to the way in which decisions are observed remains an open question if certain rationality requirements are taken as the basis for observation. However, this sort of well-considered (autological) second-order observation is hardly to be expected within the system and, above all, as a mode of everyday communication. Although second-order cybernetics may well postulate that all observations are to be observed as operations of observing systems, this does not impose the empirical assumption that the autological conclusion applies to all observations and that every observations says to itself: I am only the observation of an observer.

If crises in observation and growing uncertainty in decision-making arise, and if society itself has no remedy at hand, an obvious way out is to find "ethical" criteria that one can accept, however recklessly and provisionally, as in constructivist self-reflection in the sense of second-order cybernetics. But ethics are always directives for first-order observers. They do not ask who the

observer is that distinguishes between ethical principles and behavior (at best they ask about the justification for these benchmarks), and attribute discrepancies between principles and behavior to behavior and not to the principles. Here, too, there may well be criticism and changes; but if ethics are involved and are to remain so, old values have to be replaced by new ones; otherwise the ethics in question would disintegrate.

Nevertheless, second-order cybernetics is not an "impractical" orientation, which one cannot seriously recommend let alone put into practice. Alone, the extent to which family therapists or organizational consultants apply this model suggests otherwise. But this constructivist attitude does not lead directly to principles, guidelines, or recipes, let alone to decisions. It leads directly to a paradox, namely to the question about the observer who cannot present himself in his distinctions and therefore remains invisible. Or to the paradox of undecidable decisions. But this need not remain so. It is an old wisdom of rhetorical paradoxization that this form serves to pose the question whether the conventional distinctions and indications can be abandoned for other forms of paradox resolution. In the schema of problem and problem-solving, the paradox then serves as insoluble problem, which can prompt reformation of the distinction between problem and problem-solving. This can obviously not take place in a rational fashion, since the basal meaning of the paradox has to be conceded, but perhaps in an intelligent fashion that manages to accommodate itself to existing conditions.

#### Notes

1. See Klaus P. Japp, *Verwaltung und Rationalität*, in: Klaus Dammann et al. (eds.), *Die Verwaltung des politischen Systems: Neuere systemtheoretische Zugriffe auf ein altes Thema*, Opladen 1994, 126-141.
2. In a broader context see Richard Harvey Brown, *Rhetoric, Textuality, and the Postmodern Turn in Sociological Theory*, in: Steven Seidman (ed.), *The Postmodern Turn: New Perspectives on Social Theory*, Cambridge 1994, 229-241. See also idem., *Society as Text: Essays on Rhetoric, Reason, and Reality*, Chicago 1987.
3. See Bernard Ancori, *Apprendre, se souvenir, décider: Une nouvelle rationalité de l'organisation*, Paris 1992, 25 ff.
4. This is the argument advanced by Japp loc. cit.
5. See Arthur L. Stinchcombe, *Information and Organizations*, Berkeley 1990.
6. See Barry M. Staw, *Rationality and Justification in Organizational Life*, in: Barry M. Staw and Larry L. Cummings (eds.), *Research in Organizational Behavior* 2 (1980), 45-80.
7. That differences have to be assumed is taken too little into account. But see Elena Esposito, *Die Orientierung an Differenzen: Systemrationalität und kybernetische Rationalität*, *Selbstorganisation* 6 (1995), 161-176.

8. See, for the development of poetry from Dryden to Shelley, Earl R. Wasserman, *The Subtler Language: Critical Readings of Neoclassic and Romantic Poems*, Baltimore 1959.
9. This is by no means the case only for production organizations but, to go by the abundant literature on reform in the education system, also for schools and universities. The general complaints about the leisurely pace prevailing in governmental bureaucracies follow this pattern.
10. See Massimo Warglien, Learning in a Garbage Can Situation: A Network Model, in: Massimo Warglien and Michael Masuch (eds.), *The Logic of Organizational Disorder*, Berlin 1996, 163-182: "one of the most radical and puzzling attempts to shape a theory of intelligent behavior when the main assumptions of rational (or quasi rational) decision making are violated" (163).
11. See above all the trail-blazing contribution by Richard M. Cyert and James G. March, *A Behavioral Theory of the Firm*, Englewood Cliffs, NJ 1963, 2nd ed. with an epilogue outlining subsequent developments, Oxford 1992.
12. Martha S. Feldman, *Order Without Design: Information Processing and Policy Making*, Stanford 1989, 123, defines: "A skill is a sequence of behavior in which each action is conditional upon the previous action or state."
13. On the search for excellence see also Robert E. Quinn, *Beyond Rational Management: Mastering the Paradoxes and Competing Demands of High Performance*, San Francisco 1989.
14. See also Niklas Luhmann, Das Risiko der Kausalität, *Zeitschrift für Wissenschaftsforschung* 9/10 (1995), 107-119.
15. See the trail-blazing contribution by Arthur Rosenblueth, Norbert Wiener, and Julian Bigelow, Behavior, Purpose, and Teleology, *Philosophy of Science* 10 (1943), 18-24; also Lawrence K. Frank et al., Teleological Mechanism, *Annals of the New York Academy of Sciences* 50 (1948), 189-196.
16. This had always been presupposed in systems theory and is not called into question by the concept of autopoiesis. For many similar views see, e.g., Jurgen Ruesch and Gregory Bateson, *Communication: The Social Matrix of Psychiatry*, New York 1951, S. 8, 75 f.; Ludwig von Bertalanffy, General Systems Theory: A Critical Review, *General Systems* 7 (1962), 1-20; F.E. Emery and E.L. Trist, The Causal Texture of Organizational Environments, *Human Relations* 18 (1965), 21-32. See also the important remarks by Chester I. Barnard, *The Functions of the Executive*, Cambridge, MA 1938 (reprinted 1951), 250 f., that no system can attribute success or failure to single causes (e.g., persons). "This is to say that no specific statement can be made significantly except it be in terms of *differential effect*. Hence, the notion of cause and effect in an absolute sense is not pertinent."
17. See Francis Heylighen, Causality as Distinction Conservation: A Theory of Predictability, Reversibility, and Time Order, *Cybernetics and Systems* 20 (1989), 361-384.
18. The mythology of deciding tends to describe decisions as spontaneous, as causeless, and at best to concede the decision-maker needs "motives" to decide.
19. See J. D. Dermer and R. G. Lucas, The Illusion of Managerial Control, *Accounting Organizations and Society* 11 (1986), 471-482.
20. For the temporal reference of prudentia, which distinguishes humans from animals, which can react only sensorily, there was a long tradition of taking Cicero's De

officiis I,IV,11 (zit. nach Loeb Classical Library XXI, London 1968, S. 21) to be the decisive source: "*Sed inter hominem et beluam hoc maxime interest, quod haec tantum, quantum sensu movetur, ad id solum quod adest quodque praesens est se accomodat paulum admodum sentiens praeteritum aut futurum; homo autem quod rationis est particeps per quam consequentia cernit, causas rerum videt earumque praegressus et quasi antecessiones non ignorat.*" On further effects, see Rodolfo de Mattei, Sapienza e Prudenza nel pensiero politico italiano dall Umanesimo al sec. XVII., in: Enrico Castelli (ed.), *Umanesimo e Scienza politica*, Milano 1951. The basic idea can be attributed via Aristotle to Anaxagoras. This tradition was upheld until well into the eighteenth century for as long as school instruction was guided by prudentia.

21. See James G. March and Johan P. Olsen, *Ambiguity and Choice in Organizations*, Bergen, Norwegen 1976.
22. See Karl E. Weick, Re-Punctuating the Problem, in: Paul S. Goodman, Johannes M. Pennings, et al., *New Perspectives on Organizational Effectiveness*, San Francisco 1977, 193-225 (193).
23. See: The Organization of Hypocrisy: Talk, *Decisions and Actions in Organizations*, Chichester 1989, and the critical review by M. Reed, Organizations and Rationality: The Odd Couple, *Journal of Management Studies* 28 (1991), 559-567.
24. See Bo L. T. Hedberg, Paul C. Nystrom, and William H. Starbuck, Camping on Seesaws: Prescription for a Self-Designing Organization, *Administrative Science Quarterly* 21 (1976), 41-65. However, the authors were unable to show that an organization that complies with these prescriptions will in fact be successful forever. It is therefore nothing more than a change in the self-description of the system. "A self-designing organization," to quote op. cit. 43, "functions most smoothly if its ideology cherishes impermanence."
25. See Theodor M. Bardmann, *Wenn aus Arbeit Abfall wird: Aufbau und Abbau organisatorischer Realitäten*, Frankfurt 1994.
26. Alphonse Daudet, *Aventures prodigieuses de Tartarin de Tarascon*, *Œuvres complètes* vol. 1, Paris 1899, 51 f. and 52.
27. See Niklas Luhmann, Die Paradoxie der Form, in: Dirk Baecker (ed.), *Kalkül der Form*, Frankfurt 1993, 197-212.
28. See Robert E. Quinn and Kim S. Cameron (eds.), *Paradox and Transformation: Toward a Theory of Change in Organization and Management*, Cambridge, MA 1988.
29. See Chris Argyris, Crafting a Theory of Practice: The Case of Organizational Paradoxes, in: Quinn and Cameron op. cit.. 255-278.
30. That family therapy argues the other way round, considering "double bind" to be a cause of pathological developments in families, may well be irritating but cannot necessarily be taken as a counterargument. Families and organizations, precisely from the point of view of the covert indication of personal attitudes, cannot simply be compared.
31. The much discussed Japanese methods of production could perhaps be analyzed in this way. The principle appears to be that perfection is possible (although it is not possible). The demands are reduced as directly as possible to situations that in various ways reflect a world of harmony and, in close communicative association, are successively developed from situation to situation. In this manner, it appears

possible to exclude the problems of Western thought that have to do with distinctions, demarcations, linearities, concatenations, etc. If under certain circumstances this proved successful, this is no reason to conclude that it is also rational.

32. See Niklas Luhmann, *Zeichen als Form*, in: Dirk Baecker (ed.), *Probleme der Form*, Frankfurt 1993, 45-69.
33. See George Spencer Brown, *Laws of Form*, reprint of the 2nd ed. New York 1979.
34. See op. cit. 56 ff.
35. It should be mentioned that Spencer-Brown (op. cit. p. XXX) interprets the central operator of mathematics, the equals sign, to mean "is confused with." One could also say that with this sign a boundary is formulated whose crossing must not produce any information.
36. Jurgen Ruesch and Gregory Bateson, *Communication: The Social Matrix of Psychiatry*, New York 1951, 2nd ed. 1968, 238, addressing the reality concept in psychiatry.
37. See above 357 ff.
38. A corresponding theory of the sequence of artistic-stylistic innovations is outlined in Michael Baldwin, Charles Harrison, and Mel Ramsden, *On Conceptual Art and Painting, and Speaking and Seeing: Three Corrected Transcripts*, *Art-Language NS* 1 (1994), 30-69 (esp. 31 f.). On "redescription" see also Mary Hesse, *Models and Analogies in Science*, Notre Dame 1966, 157 ff.
39. See Spencer Brown op. cit.. 57 with reference to the mathematical operations of arithmetic and algebra, which come up against their limits with the introduction of a reentry. And, it should be noted, it is not a matter of an indeterminacy that goes back to dependence on the environment, thus to independent variables, but an indeterminacy generated in the system itself.
40. Recent literature on the memory of organizations acknowledges this. See, e.g., James P. Walsh and Gerardo Rivera Ungson, *Organizational Memory*, *Academy of Management Review* 16 (1991), 57-91. But this means that memory is ambivalent in relation to rationality - sometimes helpful, sometimes disadvantageous.
41. This "error" is often noted in the literature and combated with demands for innovation, creativity, etc. See Walsh and Ungson op. cit. The problem can be more clearly defined if one accepts our thesis that a system can remember *only states of its own* and not states of the environment to which it has no access.
42. See Nils Brunsson, *The Irrational Organization: Irrationality as a Basis for Organizational Action and Change*, Chichester 1985. See also idem, *The Organization of Hypocrisy: Talk, Decisions and Actions in Organizations*, Chichester 1989.
43. Husserl had, of course, proposed such a concept of reason as the telos of Western philosophy as a way out of certain constrictions of European modernity. See Edmund Husserl, *Die Krisis der europäischen Wissenschaften und die transzendente Phänomenologie*, *Husserliana* vol. VI, Den Haag 1954.
44. See Josef Wieland, *Die Wirtschaft der Verwaltung und die Verwaltung der Wirtschaft*, in: Klaus Dammann et al. (ed.), *Die Verwaltung des politischen Systems: Neuere systemtheoretische Zugriffe auf ein altes Thema*, Opladen 1994, 65-78 (74). Wieland calls the economy "the guidance system of modern societies."

45. As in a quartet, one could say, the second violin. But closer examination can show that precisely in this domain overall performance depends essentially on the tool that occupies the least space in the prominence scale.
46. See only Jules Michelet, *L'amour*, Paris 1858.
47. The alternative authentic love/*homme copie* had already been noted at the beginning of the nineteenth century; but with a clear preference for authentic love over merely adopted identification. See Stendhal (Henri Bleyle), *De l'amour* (1822), Paris 1959. And naturally novels like *Madame Bovary* and *Effi Briest*. *René Girard was then to resolutely reverse the weighting in Mensonge romantique de vérité romanesque*, Paris 1961.
48. See Niklas Luhmann, *Protest: Systemtheorie und soziale Bewegungen* (ed. Kai- Uwe Hellmann), Frankfurt 1996.
49. Recent research has demonstrated that the phenomena described as "fundamental-ism" are new developments of the second half of the twentieth century, and that they are not the continuation of old traditions but a revival inspired by intellectuals. However, this tells us nothing about the extent to which this is in reaction to general globalization trends, for instance, in the money economy, in nationally (and not ethnically) oriented policy, in the dominant science that excludes "para" phenomena, or at least also in reaction to conditions in organized work. There will presumably be regional differences, and the historical speed of changes has to be taken into account.
50. See Frederick Steier and Kenwyn K. Smith, Organizations and Second Order Cybernetics, *Journal of Strategic and Systemic Therapies* 4, 4 (1985), 53-65.