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Risk: A Sociological Theory

de Gruyter

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Translated by Rhodes Barrett

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Contents

Introduction

One of the essential characteristics of a critical sociology is a refusal to be satisfied with merely describing the regularities discerned in society. Extending the range of apprehensible regularities – for instance by using statistical procedures and by uncovering latent structures in statistical data – is certainly among its tasks. We go beyond this, however, if we ask how society itself explains and handles deviance from the norm, misfortune, and the unanticipated occurrence. This dark side of life, this burden of disappointment when expectations come to nothing, must be all the more evident the more one is compelled to rely on events taking a normal course. Bureaucracies in particular develop an extreme sensitivity to deviance from the schema. And tribal societies struggling to survive in a hostile environment manifest a characteristic and considerable semantic effort to propitiate the gods, to discover scapegoats, and to consecrate the victims of unheralded calamities. The very vehemence, the frequent extravagance of such attempts reveals what is being done to protect an always precarious normality, just as the supposedly irrational betrays how a perhaps quite inadequate concept of rationality is being defended. For the very reason that breaching the normal form has to be registered as chance because it is not anticipated, explaining it cannot be left to chance; it must be shown to have an order of its own, a secondary normality as it were.[1] Thus the question of how misfortunes are explained and handled contains a significant critical potential – critical not in the sense of an appeal to reject the society that finds itself exposed to such misfortunes, but critical in the sense of a

1 This was incidentally the subject of a social anthropology study now regarded as a classic: E. E. Evans-Pritchard, *Witchcraft, Oracles and Magic Among the Azande* (Oxford, 1937).

heightened, not self-evident capacity to draw distinctions. We are dealing with the other side of the normal form – and it is only by referring to the other side of the normal form that it can be recognized as form.[2]

The fact that present-day society is so much concerned with risk could, if we follow up these thoughts, cast light on its normal form. This is not to say (true as it may be) that risk is among the normal aspects of daily life. The question is rather what we can learn about normal processes in our society from the fact that it seeks to comprehend misfortune in the form of risk. And no longer, for example, in the form of magic and witchcraft; and hardly any longer in the form of religion, having accepted a purely benevolent God and a devil who has forfeited his cosmological function if not his very existence.

It is striking that the language of science employs concepts of misfortune besides 'risk', such as disharmony, catastrophe, and chaos. This should not be dismissed as making light of misfortune, as if it could be contained by a somewhat more complicated mathematics and thus normalized. But it is clearly an explanation that manages without religion, an explanation that perceives the normal in the functioning of technology, in the conditions permitting rationality, and above all in the dependence of the future on the making of decisions. The question arises of how normal normality still is. Ulrich Bech attempted recently to goad sociologists meeting at Frankfurt with this question.[3] But despite all the turbulences eroding tradition there is no serious likelihood of normality – that is to say, the distinction between normal and deviant – disappearing, or of us having to lose our habit of observing society in terms of this distinction because it has ceased to be useful.

The more pertinent question is: what do we see if we retain the dichotomy normal/deviant (in whatever semantic guise) as an instrument for observing today's society? And with special reference to our

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2 The terms normal form and normal form analysis ('Normalform', 'Normalformanalyse') can also be found, but used in a different sense, in Michael Gieseke, *Die Untersuchung institutioneller Kommunikation: Perspektiven einer systematischen Methodik und Methodologie* (Opladen, 1988).

3 See also the lecture published in the *Frankfurter Allgemeine Zeitung* (19th Oct. 1990): 'Die Industriegesellschaft schafft sich selber ab.'

topic: what understanding of rationality, of decision, of technology, of future or of time per se is presupposed when we use the term risk? Or even more fundamentally: how do we comprehend our society if we turn the concept of risk – once a matter only for mariners, mushroom-pickers, or other groups exposing themselves to danger – into a universal problem neither avoidable nor evadable? What is now necessary (necessary for welfare)? And accordingly: What is chance? How does society in the normal performance of its operations cope with a future about which nothing certain can be discerned, but only what is more or less probable or improbable? Moreover, how is social consensus (or even a mere temporary common basis for communicating) to be achieved if this is to take place within the horizon of a future about which – as everyone knows – one's interlocutor, too, can express himself only in terms of probability and improbability?

One aspect is especially worth noting: whereas individuals normally concern themselves only with probabilities of medium-range frequency, ignoring what is highly improbable, and on the other hand the highly probable (for instance that one will not manage to make ends meet) has been normalized,[4] risk awareness today shows evidence of deviant circumstances, especially a fascination with the possibility of extremely improbable occurrences, which – when they do happen – constitute a disaster. This cannot be explained alone by the fact that technology offers such possibilities; this is, after all, true to a far higher degree (of probability) with respect to natural disasters, epidemics, and the like in older societies. The explanation is likely to be that nowadays people or organizations – that is to say decisions – can be identified as the root cause. It makes sense to oppose. Or to put it more precisely, to communicate one's opposition. Without talking nonsense one can demand that such dangers be obviated. The obsession – at first sight psychologically improbable – with extremely improbable but potentially severe damage or loss can be explained in terms of communication, i.e., in sociological terms. And it can, moreover, be explained against a background of an entirely normal, plausi-

4 For a survey of research see, for example, Mary Douglas, *Risk Acceptability According to the Social Sciences* (New York, 1985) esp. p. 29 ff.

bly postulated reality: namely that the future depends on decisions made in the present or, if already made, that have not been revised.[5]

This extravagant concern with extreme improbabilities, itself improbable, naturally has consequences. In this case we see the principal consequence as being the destruction of the conditions for a tenable consensus and for a common basis for communication. Behaviour towards such eventualities and the acceptability of such risk remain controversial. And efforts to base decisions on rational calculation not only remain unsuccessful, but in the last instance also undermine the claim of method and procedure to rationality.

While research into risk is still concerned – albeit only partially – with the rational calculation of risk,[6] reality has long since manifested other features. Risk communication itself has become reflexive and thus universal. Refusing to assume risks or demanding their rejection have become dangerous behaviour. The reaction is a refusal to calculate whenever one feels that risky behaviour could lead to disaster. Fixing the disaster threshold is almost at the discretion of the person arguing in these terms. At all events this point is not susceptible to consensus. Communication can nevertheless be moralized as long as

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5 We note only in passing that 'communication' is a blanket explanation requiring further specification. It is above all likely that a role is played by the selectivity of the mass media, which present certain improbabilities – when they do occur – in an all the more striking manner; while others, especially those without news value, are not publicized, or only within the context of everyday incidents, that is to say of normalized improbabilities. An explanation in terms of 'communication' also represents the key to more finely differentiated analyses. See for example the studies by W. Kip Viscusi and Wesley A. Magat, *Learning about Risk: Consumer and Worker Responses to Hazard Information* (Cambridge, Mass., 1987), which have established an over-reaction to information about relatively improbable risks by consumers but not by workers (p. 90 ff.; 127 ff.).

6 However, the concession is made that it can only be a matter of context-dependent 'bounded rationality'; or that models are constructed that no one is expected to implement after having learned that people calculate differently.

victims can be identified.[7] This has induced the opponents of such risks to bring the topos 'future generations' into play. Even if it must remain uncertain to what degree these generations will still be human beings in our sense of the term, and even if the strictly ethical argumentation and justification remain controversial,[8] it is at any rate rhetorically well-suited for the purpose of extending the range of disasters to be taken into consideration – of eventualities that one cannot under any circumstances desire – while at the same time removing them from the scope of calculation. The ethic of ensuring the nonoccurrence of disaster is so generalized that it can be imposed on, and morally expected of, everyone. And the moral aspect is strengthened by the fact that, after all, one is not thinking about oneself but about others, perhaps even about those yet to be born. This can be countered by arguing that this behaviour, too, involves confronting unknown and perhaps much more immediate risks. But – arguing from a moral point of view – this amounts to renouncing all willingness to communicate.

Exaggeration in these controversies cannot be denied, but to describe them in terms of a rational/irrational schema would be entirely inappropriate and itself only an element in controversy. Nor can the relation between reality and how misfortune is perceived be dismissed as it could in times when there were still magicians and witches. The arguments have the backing of the natural sciences. Doubt cannot be cast on the toxicity of certain wastes produced by the chemical industry any more than it can on radiation, half-life values, the protective function of the ozone layer, and so on. This is precisely what makes the problem sociologically interesting. For precisely this factor reveals that – and how – society, by producing a semantics of misfortune convincing in each respective set of circumstances, reflects its normality. For this reason a sociological investigation also cannot seek to take sides, let alone to decide the issue. If we accept as our point of departure that we are dealing with a normal form analysis (which we are not obliged to do, since the investigation can also be

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7 'Ethically objectionable acts must have victims,' according to Douglas, op. cit., p. 11.

8 See R. S. Sikora and Brian Barry, eds., *Obligations to Future Generations* (Philadelphia, 1978), and the discussion this triggered off.

conducted on the basis of other distinctions), the aim can be only to find out more exactly what is going on.

Above all, this requires exact definition of the concept of risk, and analysis of the reasons why the concept and the facts it refers to have been gaining in importance in the more recent development of the societal system. We will reply to this question with the thesis that the dependence of society's future on decision making has increased, and nowadays so dominates ideas about the future that all concept of 'forms of being', which – as Nature – intrinsically limit what can happen, has been abandoned. Technology and the concomitant awareness of capability has occupied nature's territory, and both surmise and experience indicate that this can more easily prove destructive than constructive. The fear that things could go wrong is therefore growing rapidly and with it the risk apportioned to decision-making.

In this analysis the concepts of decision and technology (in a sense yet to be specified) play an important role. It is thus all the more necessary to point out from the start that no mental and no material (machine-like) phenomena are meant. Our analysis of society is exclusively concerned with communications. Communication, and nothing else, is the operation by which society as a system produces and reproduces itself by 'autopoiesis'.[9] This is naturally not to deny that the environment of the societal system contains realities that an observer can describe as consciousness or as machine. But, if we take as our point of reference the societal system, these facts can be taken into account only as belonging to the environment of this system. Consciousness is an indispensable condition for communication, but is not in itself communication.[10] And technology can (only) be spoken of in a double meaning of the term – as communication technology (above all the written word) and as the topic of communication. It is thus at best an abbreviated (practical but indispensable) way of putting it

9 For greater detail see Niklas Luhmann, *Soziale Systeme: Grundriß einer allgemeinen Theorie* (Frankfurt, 1984).

10 I have elsewhere described this more precisely with the concept of structural coupling. See Niklas Luhmann, 'Wie ist Bewußtsein an Kommunikation beteiligt?' in Hans Ulrich Gumbrecht and K. Ludwig Pfeiffer. eds., *Materialität der Kommunikation* (Frankfurt, 1988), pp. 884-905; Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt, 1990), p. 11 ff.

Chapter 1
The Concept of Risk

I.

Risk is addressed nowadays by a wide variety of special research areas and even by different scientific disciplines. The traditional statistical treatment of risk calculation has been joined by economic research. Instrumental in this development has been the brilliant approach taken by Frank Knight.[1] His original aim was to explain entrepreneurial profit in terms of the function of uncertainty absorption. This was no new idea: Fichte had already introduced it in relation to the ownership of land and class differentiation. In the modern context of economics, however, it has permitted the astute linking up of macro and micro-economic theory. Knight's distinction between risk and uncertainty has, however, meanwhile petrified into a sort of dogma – so that conceptual innovation earns the reproach of not having applied the concept correctly. But other disciplines do not face the problem of explaining company profits, nor are they concerned with the differences and connections between theories of the market and the business enterprise. Why should they then draw the concept from this source?

Statistical theories have been joined by applications in the fields of decision and games theory interested in their own controversies – such as the degree of meaningful subjectivization of expectations and preferences. As a sort of countermove, psychologists and social psychologists have established that in reality people do not calculate in the way they should if they put store by earning the attribution 'rational' from the statistician. They commit 'errors', some would say. Others would claim that they act in a manner adapted to the requirements of everyday life. In any case it is striking that such deviance displays both structure and direction. The gap is growing ever wider and

1 See Frank Knight, *Risk, Uncertainty and Profit* (Boston, 1921).

deeper. As in continental drift, the disciplines are moving farther and farther apart. We now know that housewives in the supermarket and street children in Brazil can calculate highly successfully – but not the way they learned to do so, or did not learn to do so, at school.[2] We know that values can be quantified – with the result that what was really meant can no longer be recognized.[3] And not only private persons cannot do so or do not make the effort. In positions where rationality is among the duties attributed to the role, where particular care and responsibility in dealing with risks are expected, even in the management of organization – risks are not calculated quantitatively; or at least not in the way conventional decision theory proposes.[4] But if this is the case, what use are theories of risk that determine their conceptual approach in terms of quantitative calculation? Is the aim, as in certain moral theories, only to set up an ideal to permit everyone to establish that he cannot live up to it – luckily no more than others can? Handling quantity and its practical relevance are at stake – at any rate for specialized areas of research and the academic disciplines.

Still within these models of quantitative risk calculation, which are generally guided by the subjective expectation of advantage, we now realize that an important correction must be made. We shall refer to it as the *disaster threshold*. One accepts the results of such a calculation, if at all, only when it does not touch the threshold beyond which a (however unlikely) misfortune would be experienced as a disaster. For this reason subsistence farmers are highly averse to risk because

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2 See Terezinha Nunes Carraher, David William Carraher, and Analúcia Schliemann, 'Mathematics in the Streets and in Schools'. *British Journal of Developmental Psychology* (1985), pp. 21-29; Terezinha N. Carraher, Analúcia D. Schliemann and David W. Carraher, 'Mathematical Concepts in Everyday Life,' in G. B. Saxe and, M. Gearhart, eds., *Children's Mathematics* (San Francisco, 1988), pp. 71-87; Jean Lave, 'The Values of Quantification,' in John Law, eds., *Power, Action and Belief: A New Sociology of Knowledge*? (London, 1986), pp. 88-111.

3 As one example of numerous treatments of this topic, see Eric Ashby, *Reconciling Man with the Environment* (London, 1978).

4 See James G. March and Zur Shapira, 'Managerial Perspectives on Risk and Risk Taking.' *Management Science*, 33 (1987), pp. 1404-1413, and the empirical studies evaluated there.

they are under the constant threat of hunger, of losing their seed, of being unable to continue production.[5] Under money economy circumstances we find corresponding results: entrepreneurs facing liquidity problems are less willing to take risks than those who are not plagued by this problem when the risk is of a given magnitude.[6] It will probably be necessary to take into account that the disaster threshold will have to be located at very different positions, depending on whether one is involved in risk as a decision maker or as someone affected by risky decisions.[7] This makes it difficult to hope for consensus on such calculation even when dealing with specific situations.

But that is not all. In the meantime the social sciences have discovered the problem of risk as well; but not so to speak in their own front yard, but because it has not been nurtured and watered with enough care in neighbouring plots. Cultural anthropologists, social anthropologists, and political scientists point out – and rightly – that the evaluation of risk and the willingness to accept risk are not only psychological problems, but above all social problems. In this regard one behaves as the pertinent reference group expects one to, or – either in conformity with or in breach of prevailing opinion – in terms of one's socialization.[8] The background to this position, although initially only

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5 See, for a broader survey, Elisabeth Cashdan, ed., *Risk and Uncertainty in Tribal Societies* (Boulder, 1990). See also, for example, Allen Johnson, 'Security and Risk-Taking among Poor Peasants: A Brazilian Case.' In George Dalton, ed., *Studies in Economic Anthropology* (Washington, 1971), pp. 1443-150; James Roumasset, *Rice and Risk: Decision making among Low-Income Farmers* (Amsterdam, 1976); James Roumasset et al., eds., *Risk, Uncertainty, and Agricultural Development* (New York, 1979); John L. Dillon and Pasquale L. Scandizzo, 'Risk Attitudes of Subsistence Farmers in Northeast Brazil: A Sampling Approach.' *American Journal of Agricultural Economics*, 60 (1978), pp. 425-435.

6 See Peter Lorange and Victor D. Norman, 'Risk Preference in Scandinavian Shipping.' *Applied Economics*, 5 (1973), pp. 49-59.

7 See greater detail in Chapter 6.

8 Provocative in this regard: Mary Douglas and Aaron Wildavsky, *Risk and Culture: An Essay on Selection of Technological and Environmental Dangers* (Berkeley, 1982); Mary Douglas, *Risk Acceptability According to the Social Sciences* (London, 1985). See also Branden B. Johnson and Vincent T. Covello, eds., *The Social and Cultural Construction of Risk:*

postulated as a countertheory, is a better understanding of the extent of the problem, inspired above all by the technological and ecological problems confronting modern society. This brings to the foreground the question of who or what decides whether (and within which material and temporal contexts) a risk is to be taken into account *or not*. The already familiar discussions on risk calculation, risk perception, risk assessment and risk acceptance are now joined by the issue of selecting the risks to be considered or ignored. And once again, discipline-specific research can reveal that this is not a matter of chance but that demonstrable social factors control the selection process.

However, these efforts still presuppose an individualistic point of departure. They modify the results of psychological research. If, for example, such research demonstrates that individuals in everyday contexts typically underestimate risks – perhaps because everything has gone well to date and because one overestimates one's capacity for controlling events and underestimates the extent of loss or damage that can be suffered in situations one has yet to experience, – then we can pose the question of how communication that seeks to raise the level of risk awareness must be constituted.[9] There is no doubt that by

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Essays on Risk Selection and Perception (Dordrecht, 1987); Lee Clarke, 'Explaining Choices among Technological Risks.' *Social Problems*, 35 (1988), pp. 22-35 (stressing intervening organizational interests); Christoph Lau, 'Risikodiskurse: Gesellschaftliche Auseinandersetzungen um die Definition des Risikos.' *Soziale Welt*, 40 (1989), pp. 418-436 (with emphasis on the difference in perspective between interested parties and those affected; Aaron Wildavsky and Karl Drake, 'Theories of Risk Perception: Who Fears What and Why', *Daedalus* 119(4) (1990), pp. 41-60.

9 There has been research, for example, in the field of warnings against risks in product advertising (see W. Kip Viscusi and Wesley A. Magat, *Learning About Risk: Consumer and Worker Responses to Hazard Information* (Cambridge, Mass., 1987). The multifarious efforts to influence sexual behaviour in the face of the AIDS risk fall under this heading. Generally speaking we may assume that a policy of information is more likely to bear success that a recognizably educative intention. See Douglas, op.cit.(1985), p. 31 ff. for further indications. Mere information confirms to a certain extent the individual's image of himself, leaving the

including social contexts and operations, a necessary complementation of psychological insights is provided as well as a convincing explanation of why individuals react differently in differing social situations. As we learn more and more in this respect, however, we finally reach a point where we have to ask ourselves whether attribution to individual decision making (whether rational, intuitive, habitual etc.) can still be regarded as tenable at all. Or whether, leaving this aside, we should not attempt a strictly sociological approach, tackling the phenomenon of risk only in the sense of communication – naturally including communication of decisions made by individuals.

Without taking such a radical stance, sociology has finally also turned its attention to the problem of risk; or it has at least laid claim to the term risk. Following the ebbing of anticapitalist prejudice, it now finds a new opportunity to fill its old role with new content, namely to warn society.[10] At present this function is, however, being performed completely without reflection; and by this we mean that sociology is not reflecting on its own role. For even if the sociologist knows that risks are selected: *why and how does he do this himself*? Sufficient theoretical reflection would have to recognize at least the 'autological' component that always intervenes when observers observe observers. The social determination of all experience and action recognized by sociology also applies *mutatis mutandis* with regard to the discipline itself. It cannot observe society from without, it operates from within society; and of all observers, *it should be the first to realize the fact*. It may all very well adopt the topics of the moment, may support protest movements, may describe the dangerous nature of modern technology or warn against irreparable environmental damage. But others do the same. What ought to go beyond this is a theory of the selectivity of all societal operations, including the observation of these operations; indeed, even including the structures determining these operations. For sociology, the topic of risk ought thus to be subsumed under a theory of modern society, and should be shaped by

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decision up to him, while anything going beyond this and still addressing the individual appears 'paternalistic' and demands of the individual that he bow to exhortations contrary to his inclinations.

10 See Ulrich Beck, *Die Risikogesellschaft: Auf dem Weg in eine andere Moderne* (Frankfurt, 1986).

the conceptual apparatus thereof. But there is no such theory, and the classical traditions that continue to guide the majority of theoreticians in the field of sociology provide few openings for topics such as ecology, technology, and risk, not to speak of the problems of self-reference.

We cannot at this point discuss the general difficulties of interdisciplinary research. There is cooperation at project level, and there are areas of research that could be referred to as 'transdisciplinary' fields, for example, cybernetics and systems theory. Risk research could represent a further possibility. For the moment, however, the negative consequences of participation by numerous disciplines and special research areas are most apparent. There is no definition of risk that could meet the requirements of science. It appears that each area of research concerned is satisfied with the guidance provided by its own particular theoretical context. We must therefore question whether, in individual research areas, and even more so more in interdisciplinary cooperation, science knows what it is talking about. If only for epistemological reasons we may not assume that such a thing as risk exists, and that it is only a matter of discovering and investigating it. The conceptual approach constitutes what is being dealt with.[11] The outside world itself knows no risks, for it knows neither distinctions, nor expectations, nor evaluations, nor probabilities – *unless self-produced by observer systems in the environment of other systems.*

When we seek definitions of the concept of risk, we immediately find ourselves befogged, with an impression of being unable to see beyond our own front bumper. Even contributions addressing the

11 This should not be read as a commitment to an 'idealistic' or 'subjectivist' version of the theory of knowledge. It is intended only to mean that science (and correspondingly society as well) has to orientate its own operations on the distinction between self-reference and external reference if it is not continuously to confuse its subject matter with itself. Respecting this distinction (however internally conditioned and sustainable in its evolution) results in the 'existence' for the scientific observer of perfectly objective entities to which the concept of risk can be applied. There is, however, no guarantee that a majority of observers will agree in their identification and understanding of an object, and all the less so, the more system-differentiation in society and its subsystems advances. This alone is the problem discussed in our text.

topic directly fail adequately to apprehend the problem.[12] The concept of risk is frequently defined as a 'measure'[13]; but if it is only a problem of measurement, it is not quite clear what all the fuss is about. Problems of measurement are problems of convention, and in any case the risks of measurement (thus of measurement errors) are not the same as what is being measured as a risk. Such examples could be multiplied *ad infinitum*, paradoxically in the exact sciences in particular; for they seem to assume that exactitude has to be expressed in the form of a calculus and that the use of everyday language accordingly requires no precision.

It is, however, generally agreed that not too much attention needs to be paid to questions of definition, for definitions serve only to delimit, not adequately to describe (let alone explain) the object under investigation. After all, if it is not at all clear what one is supposed to be dealing with, it is quite impossible to start investigating. And, rightly or wrongly, the sociologist will be permitted to assume that this imprecision offers the opportunity to switch topics in accordance with fash-

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12 Baruch Fischhoff, Stephan R. Watson and Chris Hope, 'Defining Risk.' *Policy Sciences* 17 (1984), pp. 123-139, oscillate for example, between two levels: that of defining the concept of risk and that of measuring concrete risks. Lawrence B. Gratt, 'Risk Analysis or Risk Assessment: A Proposal for Consistent Definitions.' In Vincent T. Covello et al., eds., *Uncertainty in Risk Assessment, Risk Management, and Decision Making* (New York, 1987), pp. 241-249, after discussing a number of attempts at definition, provides one of his own: 'The potential for realization of unwanted, adverse consequences to human life, property, or the environment' (244, 248). But consequences of what? Can one not risk other things as well, e.g., reputation?

13 For example, Robert W. Kates and Jeanne X. Kasperson, 'Comparative Risk Analysis of Technological Hazards.' *Proceedings of the National Academy of Science* 80 (1983), pp. 7027-7038 (7029), provide the definition: 'A hazard, in our parlance, is a threat to people and to what they value (property, environment, future generations, etc.) and risk is a measure of hazard.' These measurement theory version can be developed in a variety of directions and can make a valuable contribution to the field. For a survey see Helmut Jungermann and Paul Slovic, 'Die Psychologie der Kognition und die Evaluation von Risiko.' In G. Bechmann, eds., *Risiko und Gesellschaft,* Opladen (in press).

ion and opinion, with changing sponsors, and shifts in public attention. We thus have good reason to concern ourselves initially with delimiting the object of risk research.

II.

Older civilizations had developed quite different techniques for dealing with analogous problems, and thus had no need for a word covering what we now understand by the term risk. Mankind had naturally always been preoccupied by uncertainty about the future. For the most part, however, one trusted in divinatory practices, which – although unable to provide reliable security – nevertheless ensured that a personal decision did not arouse the ire of the gods or of other awesome powers, but was safeguarded by contact with the mysterious forces of fate.[14] In many respects the semantic complex of sin (conduct contravening religious instruction) also represents a functional equivalent, inasmuch as it can serve to explain how misfortune comes about.[15] In ancient oriental maritime trade there was already what could be described objectively as risk awareness accompanied by the corresponding legal institutions,[16] which to begin with were scarcely to be distin-

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14 Rather rashly, Vincent T. Covello and Jeryl Mumpower, 'Risk Analysis and Risk Management: An Historical Perspective.' *Risk Analysis* 5 (1985), pp. 193-120, *assume* that certainty is provided by religious advice and authority. However, the evolution of highly complex divinatory methods (wisdom) in the early literate civilizations of Mesopotamia and China suggests that uncertainty was by no means removed, but was transformed in evolutionary processes into ever more complex knowledge, written records, ambiguities, or contradictions requiring interpretation, and not least of all into the figures of self-fulfilling prophecy (Oedipus type), warning against including prophecies of misfortune into one's own efforts towards avoiding it, because precisely by doing so one would trigger the conditions for its occurrence. A great deal of material is in Jean-Pierre Vernant et al., *Divination et rationalité* (Paris 1974).

15 In regard to this comparison see also Mary Douglas, 'Risk as a Forensic Resource.' *Daedalus* 119(4) (1990), pp. 1-16 (4 ff.).

16 See A. L. Oppenheim, 'The Seafaring Merchants of Ur.' *Journal of the American Oriental Society* 74 (1954), pp. 6-17.

guished from divinatory programmes, appeals to tutelary gods, etc., but which from a legal point of view – particularly as far as the distribution of roles between the suppliers of capital and the seafarers was concerned – clearly performed insurance functions, and which with relative continuity right up to the Middle Ages was thus to influence the law of maritime trade and maritime insurance. Even in non-Christian antiquity there was, however, still no fully developed decision awareness. Thus the term 'risk' first appears in the transitional period between the late Middle Ages and the early modern era.

The etymology of the word is unknown. Some suspect it to be Arabic in origin. In Europe the word is to be found already in medieval documents, but it spread only with the advent of the printing press, in the initial phase apparently in Italy and in Spain.[17] There are no comprehensive studies on the etymology and conceptual history of the term,[18] and this is understandable, since the word at first occurs relatively rarely and is used in a great variety of contexts. It finds significant application in the fields of navigation and trade. Maritime insurance is an early instance of planned risk control,[19] but elsewhere we

17 For English the *Oxford English Dictionary*, 2nd ed. (1989), vol. XIII, p. 987 provides references only from as late as the second half of the seventeenth century. for German the *Deutsches Fremdwörterbuch*, Hans Schulz, ed., later Otto Basler (Berlin, 1977) Vol. 3, p. 452 ff. gives references from the mid-sixteenth century. It should, however, be noted that the renaissance Latin term *risicum* had been in use long before, in Germany as well, so that such evidence is rather a question of whether and what was printed in German.

18 An alternative could be in historical studies of image and symbol. See Hartmut Kugler, 'Phaetons Sturz in die Neuzeit: Ein Versuch über das Risikobewußtsein.' In Thomas Cramer, ed., *Wege in die Neuzeit* (Munich, 1988), pp. 122-141.

19 The juridical typology of these contracts is worth noting. Since legal actions in the civil law tradition required both *nomen* et *causa*, new types of contract could not simply be created. Thus even in Roman times recourse was had to the misused form of the wager. The arbitrariness of an uncertain event, on the occurrence or nonoccurrence of which one could conclude wagers could also be transferred to an instance of real foreboding. See Karin Nehlsen-von Stryk, 'Kalkül und Hazard in der spätmittelalter-

also find formulations such as 'ad risicum et fortunam' or 'pro securitate et risico,' or 'ad omnem risicum, periculum et fortunam Dei' in contracts regulating who is to bear a loss in the event of its occurrence.[20] The term risk does not, however, remain limited to this field, but spreads from about 1500 on, probably with the expansion of printing. Scipio Ammirato writes, for example, that whoever propagates rumour runs a risk (*rischio*) of being asked where he obtained his information.[21] Giovanni Botero writes: 'Chi non risica non guadagna,' and following an old tradition, distinguishes this maxim from vain, foolhardy projects.[22] Annibale Romei reproaches whoever 'non voler arrischiar la sua vita per la sua religione'.[23] In a letter addressed to Claudio Tolomei by Luca Contile on 15th September 1545,[24] we find the formulation: 'vivere in risico di mettersi in mano di gente forestiere e forse barbare.' Since the existing language has words for danger, venture, chance, luck, courage, fear, adventure (aventuyre) etc. at its disposal,[25] we may assume that a new term comes into use to indicate a problem situation that cannot be expressed precisely enough with the vocabulary available. On the other hand, the word

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lichen Seeversicherungspraxis.' *Rechtshistorisches Journal* 8 (1989), pp. 195-208.

20 See Erich Maschke, 'Das Berufsbewußtsein des mittelalterlichen Fernkaufmanns.' in Carl Haase, ed., *Die Stadt des Mittelalters*, Vol. 3 (Darmstadt, 1973), pp. 177-216 (192 ff.); Adolf Schaube, 'Die wahre Beschaffenheit der Versicherung in der Entstehungszeit des Versicherungswesens.' *Jahrbücher für Nationalökonomie und Statistik* 60 (1893), pp. 40-58, 473-509 (42, 476).

21 *Della Segretezza* (Venice, 1598), p. 19.

22 *Della Ragion di Stato* (1589), quoted from the edition from Bologna 1930, p. 73. On the waning of moral criticism of foolhardiness, hubris, *superbia*, etc. see also Kugler op. cit. (1988).

23 *Discorsi* (Ferrara, 1586), p. 61.

24 Quoted by Claudio Donati, *L'Idea di Nobiltà in Secoli XIV-XVIII* (Rome, 1988), p. 53.

25 On the two last terms mentioned, practically synonymous with the present-day usage of the word 'risk', see Bruno Kuske, 'Die Begriffe Angst und Abenteuer in der deutschen Wirtschaft des Mittelalters.' *Zeitschrift für handelswissenschaftliche Forschung*, N.F. 1 (1949), pp. 547-550.

goes beyond the original context (for instance in the quotation 'non voler arrischiar la sua vita per la sua religione'), so that it is not easy to reconstruct the reasons for the new concept coming into existence on the basis of these random occurrences of the term.

With this proviso we presume that the problem lies in the realization that certain advantages are to be gained only if something is at stake. It is not a matter of the costs, which can be calculated beforehand and traded off against the advantages. It is rather a matter of a decision that, as can be foreseen, will be subsequently regretted if a loss that one had hoped to avert occurs. Since the institutionalisation of confession, religion has sought by every means to move the sinner to repentance, the religious variant of regret. Risk calculation is clearly the secular counterpart to a repentance-minimization programme; in any case an attitude inconsistent in the temporal sequence of events: first this, then that. Thus it is at all events a calculation in terms of time. And in the difference between the religious and secular perspectives lies the tension of the well-known wager proposed by Pascal[26]: The risk of unbelief is in any case too high, for it is salvation that is at stake. The risk of belief, that we genuflect quite unnecessarily, appears by contrast insignificant.

These brief references provide an initial impression that there is a complex problem in the background motivating the formation of a concept that fails, however, to supply an adequate indication of this problem. It is not a matter of mere cost calculation on the basis of reliable prognoses. Nor is it only a matter of the classical ethical supernorm of measure (*modestas*, *mediocritas*) and justice (*iustitia*) to be respected in all striving after worthwhile goods. It is not a matter of those similarly timeless forms of rationality in which a stationary society makes allowances for the fact that life must be borne as an admixture of advantages and disadvantages, of perfection and corruption, and where too much of a good thing can be bad for you. It is not only a matter of attempting to express rationality as a metarule, whether as an optimization rule or a rule of the golden medium attempting to establish the distinction good and bad as a unity while formulating

26 *Pensées* No. 451 in the classification of the edition of the Bibliothèque de la Pléiade (Paris, 1950), p. 953 ff. Pascal uses the terms *hazard*, *hazarder*.

this unity in its turn as good (as advisable). Here we are not resolving a paradox by applying the schematism of good and bad to itself. Nor has it only to do with the peripheral rhetorical caprices of discovering that bad is good and good is bad.[27] And as a result the old *prudentia* fails, which had taught that and how one can cope in those situations of life where the *varietas temporum* and the mixture of good and bad qualities in one's fellow men play a role. While the terminology of risk had already become current, all these old instruments were nevertheless made use of with still greater force – as, for instance, in the doctrines of the virtues of the prince and his advisers or in the concept of *raison d'état*. But at the same time we recognize in the dramatisation of these semantic forms that the situation is gradually slipping out of the protagonists' grasp. Whither does Richelieu cull the maxim: 'Un mal qui ne peut arriver que rarement doit être présumé n'arriver point. Principalement, si, pour l'éviter, on s'expose à beaucoup d'autres qui sont inévitables et de plus grande conséquence'?[28] The reason is probably that there are so many causes for things going wrong in improbable ways that they cannot all be allowed for by rational calculation. These maxims take us to the heart of current political controversies on the consequences of modern technologies and the ecological problems confronting modern society. This gives the concept of risk, which Richelieu did not have to employ at all, a quite different status. But which one?

Etymology alone provides no reliable lead. It gives us certain clues, above all that relations between claims to rationality and the time dimension become more and more precarious. Both indicate that it is a question of decisions that serve to bind time, although *we cannot gain sufficient knowledge of the future*; indeed, *not even of the future*

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27 For examples see Ortensio Lando, *Paradossi, cioe sententie fuori del commun parere* (Venice, 1545); Ortensio Lando, *Confutatione del libro de paradossi nuovamente composta, in tre orationi distinta* (s.l., s.a.).

28 'A misfortune that cannot occur but rarely ought to be presumed never to occur. Principally if, in order to avoid it, one exposes oneself to many others that are inevitable and of greater import.' Original quoted from the edition *Maximes de Cardinal de Richelieu* (Paris, 1944), p. 42. On the current position see Howard Kunreuther, 'Limited Knowledge and Insurance Protection.' *Public Policy* 24 (1976), pp. 227-261.

we generate by means of our own decisions. Since Bacon, Locke, and Vico, confidence in the feasibility of generating circumstances has grown; and to a large extent it has been assumed that knowledge and feasibility correlate. This pretension corrects itself to a certain degree with the concept of risk, as it does in other ways with the newly invented probabilistic calculation. Both concepts appear to be able to guarantee that even if things do go wrong, one can have acted correctly. They immunize decision making against failure, provided one learns to avoid error. The meaning of *securitas* correspondingly changes. Whereas in the Latin tradition the term had denoted a subjective frame of mind of freedom from care or as a negative value of heedlessness, especially with respect to salvation (*acedia*), in French the concept (*sûreté* – later on the objective concept of *sécurité* is added) takes on an objective meaning.[29] It is as if, in the face of an increasingly uncertain future, a secure basis for the making of decisions now had to be found. All this meant a vast expansion in the scope and pretensions of capability, and the old cosmological limitations, the constants of being and the secrets of Nature were replaced by distinctions falling within the domain of rational calculation. And this has determined the understanding of risk to this day.

If we enquire how this rationalist tradition sees the problem, we receive a simple and convincing answer: losses are to be avoided as far as possible. Since this maxim alone would restrict the radius of action too greatly, one does have to permit, and that means 'risk', actions that can in principle cause avoidable loss, provided that the estimate of the possible degree of loss appears acceptable. Still today, risks are evaluated by multiplying the degree of loss by the probability of loss.[30] In other words, it is a matter of a controlled extension of

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29 See with many references Emil Winkler, *Sécurité* (Berlin, 1939). See also the study by Franz-Xaver Kaufmann, *Sicherheit als soziologisches und soziopolitisches Problem: Untersuchungen zu einer Wertidee hochdifferenzierter Gesellschaften* (Stuttgart, 1970), that also provides evidence for a shift in meaning in the modern period.

30 See e.g., ... We can also find critical statements, not least of all from applied mathematicians. See Sir Hermann Bondi, 'Risk in Perspective.' In M. G. Cooper, ed., *Risk: Man-Made Hazards to Man* (Oxford, 1985), pp. 8-17.

rational action, just as, in the economic field, anyone who operates only with equity and not with loans does not exhaust the resources of rational action. For these purposes, it suffices to assume differing utility functions and probabilistic distributions with respect to the consequences of different decisions, and to describe the decision itself as risky in view of the differences in results. A *concept* of risk going beyond this is superfluous and would find no place in the structure of this theory.

The rationalist tradition can thus produce good reasons, and it would be inappropriate to contradict it on this level. To abstain from risk, especially under today's conditions, would mean to forswear rationality. But a sense of unease nevertheless remains. The rationalist tradition has broadly been accused of not seeing what it does not see, 'failing to take account of the blindness inherent in the way problems are formulated.'[31] If, however, we wish to observe how the rationalist tradition observes, we must free ourselves from its way of understanding of the problem. We have to leave it with its problem, but seek to understand that it cannot see what it cannot see. We have to shift the theory to the level of second-order observation. But this makes demands on concept formation inadequately served by both interdisciplinary discussion and the etymology and conceptual history of the term.

III.

Particular care in concept formation is required at the second-order level in observing observation. We assume that every observer has to make use of a distinction, since he is otherwise unable to indicate what it is that he wishes to observe. Indication is possible only on the basis of distinguishing the state indicated, and the drawing of distinctions makes it possible to indicate one or other of the sides of a distinction. These rules follow the form calculus of George Spencer

31 Thus Terry Winograd and Fernando Flores, *Understanding Computers and Cognition: A New Foundation for Design* (Reading, Mass., 1987), p. 77. See also p. 97 ff.

Brown,[32] and for this reason we occasionally speak of 'form' when we refer to a distinction separating two sides and requiring operations (and also time) – either for the purpose of recalling the name of one of the sides in order to condense identity, or to cross the boundary in order to take the other side as the point of departure for the next operation. We have chosen this rather than the usual bases, whether the theory of causation or statistical methodology, because we wish to investigate observations – and observations are nothing more or less than distinguishing indications.

A further preliminary remark should be made on the distinction between first-order and second-order observation. Every observer uses a distinction for the purpose of indicating one or other of the sides. To cross from one side to the other he requires time. He is therefore unable to observe both sides simultaneously, although each side is *at the same time* the other side of the other. Nor is he able to observe the unity of the distinction while he is making use of it, for to do so he would have to draw a distinction relative to the first distinction, thus using a further distinction for which the same would apply. In brief, observation cannot observe itself, although an observer as a system has time to switch distinctions and, at the level of observation of the second order, is thus able to observe himself as well.

Moreover, we must note two modes of drawing distinctions. The first indicates something as distinct from everything else, without specifying the other side of the distinction. What is specified by this manner of distinction we shall for the purpose of our investigations refer to as *objects*.[33] In observing objects, indicating and distinguishing the object coincide; these two operations can only performed *uno*

32 See: *Laws of Form*, quoted from the reprint (New York, 1979).

33 There are, of course, many other usages of the concept of object. What is important is that we do not proceed on the basis of the distinction object/subject; for in choosing this form (let us call the subject form) we would leave ourselves no room for what we wish to refer to in the text as 'concepts'; the form would consequently have to accommodate concepts as instruments for the observation of 'subjects', thus leading us into the trap of the insoluble problem of 'intersubjectivity'. It would no longer be possible adequately to describe the observation of observers and we would probably lose our way in the labyrinth of suspected ideology, relativism, pragmatism, pluralism discourse theory, etc.

actu. The other mode of making a distinction restricts what can constitute the content of the other side of the distinction, for instance women/men; justice/injustice; hot/cold; virtue/vice; praise/blame. The condensate of such a process of drawing distinctions shall be referred to as concepts. Both objects and concepts are distinction-dependent constructs of the observer. Concepts, however, keep the observer at a greater distance that do objects, because they separate to a greater degree the drawing of distinctions and the making of indications as observation operations, and require that distinctions be distinguished.

The late appearance in history of circumstances indicated by means of the new term 'risk' is probably due to the fact that it accommodates a plurality of distinctions within one concept, thus constituting the unity of this plurality. It is not simply a matter of a description of a universe by a observer of the first order who sees something positive or something negative, who establishes the existence or absence of something. It is rather a matter of reconstructing a phenomenon of multiple contingency, which consequently offers different observers differing perspectives.

Future loss may occur – or not, as the case may be. Seen from the vantage point of the present, the future appears uncertain, although it is already apparent now that future 'presents' will be either the way we want them to be or quite different. At the present moment we cannot know how they will turn out. But we can know that we ourselves or other observers will in a future present know what the situation is, and will then judge differently from the way we do now – although differences of judgement among us might arise.

On the other hand – and in addition to what has just been said – what can occur in the future also depends on decisions to be made at present. For we can speak of risk only if we can identify a decision without which the loss could not have occurred. It is not imperative for the concept (although this is a question of definition) whether the decision maker perceives the risk as a consequence of his decision or whether it is others who attribute it to him; and it is also irrelevant at what point in time this occurs – whether at the time when the decision is made or only later, only when the loss has actually occurred. For the concept as we intend to define it, the only requirement is that the contingent loss be itself caused as a contingency, that is to say that it be avoidable. Here, too, differences in observer perspective are con-

ceivable, offering a variety of opinions on whether a decision should be made despite the risk thereby incurred or not.

In other words, the concept indicates a highly hierarchical contingency arrangement. Following the Kantian concept with its time reference, we could also speak of a contingency *schema*. Or with Novalis we could speak of the 'Alleseinheit des Schemas'.[34] Thus the fact that two temporal contingencies, event and loss, are firmly coupled as contingencies (not as facts!), although this is not imperative, makes it possible for observers to differ in the way they see things. Temporal contingencies provoke social contingencies, and this plurality, too, cannot be cancelled out by an ontological formula. One can, of course, reach agreement on whether to make a decision or not; but this is then a matter of communication not of knowledge. Once dissolved into temporal and social differentiations there is no return to the innocence of primary observation. The gate to paradise remains sealed- by the term risk. What we have just referred to as a contingency schema strains the medium of meaning in which all experience and communication must find forms. Meaning can be defined as a medium that is generated by a surplus of indications of other options.[35] In the final instance all meaning thus resides in the distinction of actuality versus potentiality.[36] The actual is always the way it is; and in the world it is always simultaneously present with other actualities.[37] Since all systems carry out (or do not carry out) their

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34 'The all-oneness of the schema.' See 'Philosophische Studien 1795/96' in the compilation of the edition by Hans-Joachim Mähl and Richard Samuel, *Werke, Tagebücher und Briefe*, Vol. 2 (Darmstadt, 1978), p. 14. Loc. cit. also: 'Das Schema steht mit sich selbst in Wechselwirkung. Jedes ist nur auf seinem Platze, was es durch die andern ist.' 'The schema interacts with itself. Each thing in its place is what it is only by virtue of every other thing.'

35 For more detail see Niklas Luhmann, *Soziale Systeme: Grundriß einer allgemeinen Theorie* (Frankfurt, 1984), p. 92 ff.

36 Which is in its turn a distinction that can enter into itself. For, in the mode of the possible, what is actual is in its turn possible (and not impossible), while within the possible other possible actualities are indicated.

37 See Niklas Luhmann, 'Gleichzeitigkeit und Synchronization.' In Niklas Luhmann, *Soziologische Aufklärung*, Vol. 5, *Konstruktivistische Perspektiven* (Opladen, 1990), pp. 95-130.

operations in actuality, arbitrariness can never be given free rein.[38] But in the meaning-constitutive field of the possible, the plurality of perspective may increase and it might become correspondingly more difficult to give it form. We can already recognize this in the growing possibilities for negating risk – whether in the direction of security, when one asserts the impossibility of a future instance of loss, or in the direction of danger, when one denies the attributability of loss to a decision, or with the aid of secondary distinctions such as known/unknown risks or communicated/non-communicated risks. As in modal logic problems, the use of negations must thus be specified.[39] But all this happens – and it shows the practical effect of this switch to a second or third level of observation – on condition that the negation of a risk – of any sort whatsoever – in its turn also constitutes a risk.

All this, however, does not yet sufficiently explain the operative use of the concept of risk. What does this word indicate? Which side of which distinction? What negation option (which other side of which distinction) does the concept imply if we wish to define it for scientific use? If we want to know what an observer (of the second order) means when he refers to an observed prospect as risky, we must be able to state within the framework of which distinction the concept of risk indicates the one (and not the other) side. In other words, we ask for the form that guides an observer when he refers to an observation as a risk; and by 'form' we always understand a boundary, a severance separating two sides requiring us to state which side we are selecting as the point of departure for the following operation.

It is clear that the rationalist tradition sketched above, although offering us a form, does not provide a concept of risk. It translates into calculation injunctions the problem of how loss can be averted to the highest possible degree despite exploitation of the options of rationality. We then have the form optimal/nonoptimal, and thus a whole cascade of secondary distinctions to be calculated in different ways. In brief, the significance of the problem and its specific modernity

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38 Risky decisions are also decisions, are observable as actual occurrences, take place under the condition of simultaneity with other events. And all this happens the way it happens.

39 On corresponding problems and the necessity of a multivalue logic to handle them see Elena Esposito, 'Rischio e Osservazione,' MS (1990).

should not be underestimated, but on the contrary should be emphasized. But it does not supply the form that will provide us with a concept of risk.

It is widely held that the concept of risk is to be determined as a counter-concept to security.[40] In political rhetoric this has the advantage that if we speak out against all ventures deemed to be too risky, we also appear to lay great store by the generally appreciated value of safety/security. This rapidly (much too rapidly) gives rise to the idea that one really desires security, but that, given the state the world is in (formerly one would have said: beneath the moon), one has to accept risks. The risk form thus becomes a variation on the distinction of desirable/undesirable. A somewhat more refined version is to be found among safety experts. Their professional experience teaches them that absolute safety cannot be achieved. Something can always happen.[41] For this reason they use the concept of risk mathematically to specify efforts to ensure safety and the measure of what can reasonably be achieved.[42] This corresponds to the transition from deterministic to probabilistic risk analysis. Much the same is also true with respect to the literature on consumer protection.[43] This confirms the widespread tendency to define risk as a measure for mathematical processes. One can then, with an eye on the sociologists, concede that the concept of security indicates a social fiction and that one can inves-

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40 See Lola L. Lopez, 'Between Hope and Fear: The Psychology of Risk,' *Advances in Experimental Social Psychology* 20 (1987), pp. 255-259 (275 ff.). It should be noted that the German term 'Sicherheit' used by the author is a very broad term that can be translated as 'safety', 'security' or 'certainty' as the case may be (RB).

41 From this point of view one then often likes to say, due to human shortcomings.

42 Thus, e.g., E. N. Bjordal, 'Risk from a Safety Executive Viewpoint.' In W. T. Singleton and Jan Hoven, eds., *Risk and Decisions* (Chichester, 1987), pp. 41-45. See also Sylvius Hartwig (ed.), *Große technische Gefahrenpotentiale: Risikoanalysen und Sicherheitsfragen* (Berlin, 1983).

43 See Peter Asch, *Consumer Safety Regulation: Putting a Price on Life and Limb* (Oxford, 1988), e.g., p. 43: 'The prevention of all consumer accidents and injuries – 'zero risk' – is neither a realistic nor a useful goal.' Quite right! But what then?

tigate what in social communication is treated uncontroversially as certain and how stable these fictions are in the face of contrary experience (for example, announced connection times at airports).[44] Security as a counterconcept to risk remains an empty concept in this constellation, similar to the concept of health in the distinction ill/healthy. It thus functions only as a reflexive concept. Or also as a safety-valve concept for social demands that, in proportion to the variable level of demand, affect risk calculation. In effect the risk/security pair provides us with an observation schema that in principle makes it possible to calculate *all* decisions from the point of view of the risk involved. As a result, this form has the incontestable virtue of universalizing risk awareness. Thus it is not by chance that since the seventeenth century the topics of security and risk have matured in a process of mutual interaction.

These considerations induce us to pose the question of whether there can be situations where we can choose between risk and security, between risky and safe alternatives, or even whether we must choose between them. This question requires bringing the conceptual approach more accurately into focus. Such an option is frequently put forward.[45] The apparently 'safe' alternative then implies the double certainty that no loss will occur and that the opportunity will be lost that one would possible have been able to take via the risky variant. But this argument is deceptive, for the lost opportunity was in itself no certainty. It thus remains uncertain whether by forgoing the opportunity one has lost out on something or not; and what remains is an open question of whether one ought to regret preferring the 'safe' variant or not. However, this is a question that will frequently be im-

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44 Adaptation to the sensibilities of public opinion is meanwhile also playing a role. See, e.g., Chris Whipple, 'Opportunities for the Social Sciences in Risk Analysis: An Engineer's Viewpoint.' In Vincent T. Covello et al., eds., *Environmental Impact Assessment, Technology Assessment, and Risk Analysis: Contributions from the Psychological and Decision Sciences* (Berlin, 1985), pp. 91-103.

45 For example, on managerial decisions see Kenneth R. MacCrimmon and Donald A. Wehrung, *Taking Risks: The Management of Uncertainty* (New York, 1986), p. 11 and throughout. And this despite the fact that the authors are familiar with the concept of opportunity loss (see 10 *et alibi*).

possible to answer if the opportunity is not taken up at all, and the risky causal proceeding is not even set in motion. The risk of the one variant nevertheless colours the entire decision making situation. It is not possible to forgo an uncertain advantage with absolute certainty because the sacrifice might possible not be one (but one cannot know this at the time). One can refuse to be guided at all by risk-related distinctions – for instance in the context of primarily religious or otherwise 'fanatical' ventures. But when one does take risks into consideration, every variant in a decision making repertoire – that is to say the entire alternative – is risky, if only with the risk of not grasping certain opportunities that could possible prove advantageous.

Safety experts, but also all those who accuse them of not doing enough for safety, are first-order observers. They believe in facts; and when they cross swords or negotiate, it is typically on the basis of differing interpretations or differing claims in relation to the same facts (the same 'niche', as Maturana would say).[46] One demands more information, better information, complains about the information being withheld by those who wish to prevent others from projecting other interpretations or making greater demands on an objectively given universe of facts[47] – as though there *were* 'information' available that one could *have* or *not have* as the case may be. And, as we have said, the first-order observer takes this to be the real world. But the observer of the second order faces the problem that what different observers consider to be the same thing generates quite different information for each of them.

This is not true for the second-order observer who is observing another observer to see what the latter can and cannot see.

To do justice to both levels of observation, we will give the concept of risk another form with the help of the distinction of risk and danger. The distinction presupposes (thus differing from other distinctions) that uncertainty exists in relation to future loss. There are then two possibilities. The potential loss is either regarded as a conse-

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46 Impressive material on this field in Dorothy Nelkin, ed., *The Language of Risk: Conflicting Perspectives on Occupational Health* (Beverly Hills, Cal., 1985).

47 See, e.g., Michael S. Brown, 'Disputed Knowledge: Worker Access to Hazard Information.' In Nelkin op. cit., pp. 67-95.

quence of the decision, that is to say, it is attributed to the decision. We then speak of risk – to be more exact of the risk of decision. Or the possible loss is considered to have been caused externally, that is to say, it is attributed to the environment. In this case we speak of danger.

This distinction between risk and danger plays no significant role in the voluminous literature on risk research.[48] There may be a variety of reasons for this. We have already mentioned carelessness in concept formation. Linguistic reasons may also play a role. In the largely English-language literature the words risk, hazard, and danger are available and are usually employed almost synonymously.[49] There is indeed an awareness that it plays an important role in perceiving and accepting risk whether we venture voluntarily or involuntarily into dangerous situations[50]; or also whether we believe that we have the consequences of our own behaviour under control or not. But this describes only variables that one assumes, and can possible demonstrate, to influence risk perception and the willingness to take risks. In

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48 Frequently the terms risk and danger are used synonymously or overlapping in meaning. Lopez, op. cit. (1987), p. 265, writes for example: 'Risky choices are choices that have an element of danger.' Nicholas Rescher, in *Risk: A Philosophical Introduction to the Theory of Risk Evaluation and Management* (Washington, 1983), although distinguishing between running a risk and taking a risk (p. 6), himself makes hardly any further use of the distinction. Explicitly rejected by Anthony Giddens, *The Consequences of Modernity* (Stanford, Cal., 1990), esp. p. 34 f., on the grounds that risk is precisely the danger that future loss could occur; it does not depend on the consciousness of the decision maker. And indeed, it should not depend on consciousness as a purely psychic phenomenon. Nevertheless, we must differentiate between whether a loss would occur even without a decision being taken or not – whoever it is that makes this causal attribution.

49 In Ortwin Renn, 'Risk Analysis: Scope and Limitations.' In Harry Otway and Malcolm Peltu, eds., *Regulating Industrial Risks: Science, Hazards and Public Protection* (London, 1985), pp. 111-127 (113), we find in a context where we would expect conceptual clarification: 'Risk analysis is the identification of potential hazards to individuals and society'.

50 A subject of debate since the publication of Chauncey Starr, 'Social Benefits versus Technological Risk.' *Science* 165 (1969), pp. 1232-1238.

this respect it is not a matter of determining the form of the risk concept. This has to be tackled following the methodology proposed here by determining the counterconcept, and thus by distinguishing distinctions.

Like the distinction risk/security, the distinction risk/danger is constructed asymmetrically. In both cases the risk concept indicates a complex state that, at least in modern society, is a normal aspect of life. The other side acts only as a reflexive concept with the function of elucidating the contingent nature of the states covered by the concept of risk. In the case of risk/security, this can be recognized in the problems posed by measurement; in the case of risk/danger in the fact that only in the case of risk does decision making (that is to say contingency) play a role. One is exposed to dangers. Of course, the behaviour of those concerned also has its part to play, but only in the sense of it placing people in a situation in which loss or damage occurs. (If A had chosen to walk down a different street the tile would not have fallen on his head.) Another borderline case is that of choosing between very similar alternatives, for instance, between two airlines serving the same route – and the aircraft one has decided to fly with crashes. But in this case, too, one will hardly regard the decision as a risk, since no risk has been accepted in exchange for certain advantages, but a choice has simply been made between two more or less equivalent solutions to a problem, because it was possible to take only one of them. Thus if a risk is to be attributed to a decision, certain conditions must be satisfied, among which is the requirement that the alternatives being clearly distinguishable in respect of the possibility of loss occurring.

When risks are attributed to decisions that have been made, this leads to the taking of a number of consequent decisions, to a series (or a 'decision tree') of bifurcations, each in its turn offering risky decision making options. The first distinction is whether the loss remains within the usual cost bounds (that is to say within the 'profits wedge'), only raising the costs that have to be accepted; or whether it brings about a situation in which one retrospectively regrets having made the decision.[51] It is only for the purpose of dealing with this sort

51 Recently one has come to speak of 'postdecision surprise' or 'postdecision regret' and to characterize bureaucratic behaviour as an attempt to

of decision that one might subsequently have to regret that the entire mechanism of risk calculation has been developed; and it is abundantly clear that this form of rationality serves to generate a paradox, namely the demonstration that a wrong decision is nevertheless right.[52]

In the schema of risk and danger the interest in security (or risk aversion, or avoidance of danger) is still presupposed but, being self-evident, is not 'marked'.[53] The distinction of risk and danger permits a marking of both sides, but not simultaneously. Marking risks then allows dangers to be forgotten, whereas marking dangers allows the profits to be forgotten that could be earned if risky decision are made. In older societies it was thus danger that tended to be marked,

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anticipate and under all circumstances to avoid postdecision surprises (which, as we have noted above) leads to a less than optimal exploitation of opportunities for rationality. For the mathematical procedure see David E. Bell, 'Regret in Decision Making Under Uncertainty.' *Operations Research* 30 (1982), pp. 961-981; David E. Bell, 'Risk premium for Decision Regret.' *Management Science* 29 (1982/83), pp. 1156-1166; J. Richard Harrison and James G. March, 'Decision Making and Postdecision Surprises.' *Administrative Science Quarterly* 29 (1984), pp. 26-42 and the following discussion. We shall be coming back to this.

52 We could object that this formulation takes no account of the time difference between the taking of the decision and the occurrence of the loss. This is true, and it is also true that the asymmetry of the flow of time in its turn resolves the paradox. For the more finely tuned decision calculation typical of organizations this is, however, insufficient, since it may be required that the time difference be reflected in its turn. In other words, one would like be sure *now* that *at the point in time when the loss occurs* one will be able to say that one had made the right decision although from the point of view of the loss, the decision is to be regretted. In other words, we are dealing with a complex of meta-rules guaranteeing the consistency of decision evaluation despite inconsistencies. A functionally equivalent mechanism is, of course, professional tenure.

53 For the linguistic meta-distinction of marked/unmarked in relation to the sides of a distinction see John Lyons, *Semantics*, Vol. 1 (Cambridge, England, 1977), pp. 305-311. In this discussion we imagine that the presumably preferred side remains unmarked and does not therefore need to be indicated in particular. Marking is then a means of directing attention to where the problem lies.

whereas modern society has until recently preferred to mark risk, being concerned with optimizing the exploitation of opportunity. The question is whether this will remain the case, or whether the present situation is not characterized by the decision maker and the individual affected by the decision each marking the respective other side of one and the same distinction, thus coming into conflict because each party has his own way of seeing things and his own expectations about the way others see them.

These few points already clearly indicate some of the advantages to be gained from substituting the risk/security schema for that of risk/danger. The most important advantage is, however, in the use of the concept of attribution, for this concept relates to second-order observation. The concept has a long prehistory, especially in jurisprudence and economics. In these fields, however, it has always been concerned with the problem of correct attribution – for example of offence to offender or of growth in value to the production factors land, labour, capital, or organization.[54] It is only the investigation of sociopsychological attribution undertaken since the World War II[55] that has attained the level of second-order observance, without itself having this concept and its epistemological and methodological consequences at its disposal. It is now possible to observe how another observer makes attributions, for example, internally or externally in relation to himself or to others, and either to constant or to variable factors, to structures or to events, to systems or to situations. In this tradition of research, the type of attribution is thus itself seen as contingent, the attempt then being made to discover the factors correlating to types of attribution (personal traits, stratification, situational charac-

54 For a survey see Hans Mayer, 'Zurechnung', *Handwörterbuch der Staatswissenschaften*, Vol. VIII, 4th edn. (Jena, 1928), pp. 1206-1228.

55 Stimulated above all by Fritz Heider, and via Heider related both to juridical and economic methodological problems (in this connection Max Weber should be mentioned) and with Gestalt psychology research on the perception of causal relations. See especially Fritz Heider, *The Psychology of Interpersonal Relations* (New York, 1958), but also Felix Kaufmann, *Methodenlehre der Sozialwissenschaften* (Vienna, 1936), whose valuable treatment of attribution (p. 181 ff.) was not included in the English edition (1944), thus exerting no influence. (Heider will have been acquainted with it.)

teristics, role constellations such as teacher/pupil). The final step would be the *autological consequence*, i.e., the insight that these correlations, too, are attributions correlating to conditions characteristic of the second-order observer. For he, too, is an observer, and thus himself falls within the scope of what he observes.

The fact that the distinction of risk and danger is made to depend on attribution does not mean that it is left to the whim of the observer to label something as a risk or as a danger. Some borderline cases have already been mentioned – especially the fact that at present no criteria for differential decision making are in evidence, or at any rate none that has to do with the variable probability of advantage and possible loss. Of greater significance is another instance, that of damage to the environment. A given threshold being passed, an irreversible shift in ecological balance or the occurrence of a disaster is often not attributable to any particular individual decisions. Observers may well continue to fight about 'shares', for example in the question of whether and to what extent automobile exhaust fumes are responsible for the death of forests; but even then it would not be possible to classify starting up a car engine as a risky decision. We would, so to speak, have to invent decisions to accept the attribution – for example, a decision not to prohibit motoring. In other words, in the accumulation of the effects of decision making, in long-term consequences of decisions no longer identifiable, in over-complex and no longer traceable causal relations, there are conditions that can actuate considerable losses or damage without being attributable to decisions – although it is clear that without decisions having been made such detrimental effects would never have occurred.[56] For an attribution can be made to a decision only if a choice between alternatives is conceivable and appears to be reasonable, regardless of whether the decision maker has, in any individual instance, perceived the risk and the alternative, or whether he has overlooked them.

If within the context of these limitations we accept this concept of risk, the concept does not indicate a fact existing independently of

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56 Wolfgang Bonß, 'Unsicherheit und Gesellschaft – Argumente für eine soziologische Risikoforschung,' MS (Nov. 1990), speaks in this connection of second-order dangers.

whether and by whom it is observed.[57] For the moment it remains open whether something is to be regarded as a risk or as a danger. And if we wish to know which is which, we must observe the observer and if necessary develop theories on the conditioning of his observing. Both sides of the distinction can be applied to every still uncertain loss, albeit with varying degrees of plausibility in given societies; for example, to the possibility that an earthquake will destroy houses and kill people, that we can be involved in a traffic accident, that our marriage will not continue in harmony, or that we study a subject we have no use for in later life. For an economically trained eye, the loss can also consist in the failure to materialize of an advantage or benefit in expectation of which one had carried out an investment: one buys a car with a diesel motor, and shortly afterwards the tax on it is raised. In principle we could avoid every loss by making a decision, thus classifying every loss as a risk – for example, we could decide to move from an earthquake-prone area, to give up driving, or not to marry. And if the failure of advantages to materialize counts as loss, then the entire future as future must be seen to fall under the dichotomy of risk and danger. Therefore we can treat these concepts as being *generalizable at will*. There may be certain borderline cases. The danger of a meteorite striking with catastrophic consequences is one example, the probability of which is underestimated only because there is nothing one can do about it. This example teaches us, moreover, that modern society considers danger from the point of view of risk and takes it seriously only as risk. Any interest may be dichotomized in this way provided it is observed. The problem with which the topic of risk confronts us thus appears not to lie in the material dimension. As we shall seek to demonstrate at greater length, it is rather to be found in the relationship between the time dimension and the social dimension.

Finally, if we once again compare the two forms risk/security and risk/danger, this comparison alone provides us with an important insight, which – if respected – would cool down considerably the un-

57 At this stage we mention only in passing that, in the field of epistemology, this has led not to idealistic positions but to constructivist ones. See Niklas Luhmann, *Erkenntnis als Konstruktion* (Bern, 1988); Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt, 1990).

necessarily heated public discussion on risk-related topics, and allow a more moderate tone to prevail. It is true to say for both distinctions that *there is no risk-free behaviour*. For the first form this means there is no absolute safety or security.[58] For the second this means one cannot avoid risks if one makes any decision at all. Anyone following advice and not overtaking in a blind curve runs the risk of not getting along as fast as he could if there were no oncoming traffic. We may calculate any way we wish to do so, and in many cases we may arrive at unambiguous results. But these are only aids to decision making. They do not mean that if we do make some decision or other risks can be avoided.[59] And in the modern world not deciding is, of course, also a decision.

If there are no guaranteed risk-free decisions, one must abandon the hope that more research and more knowledge will permit a shift from risk to security. Practical experience tends to teach us the opposite: the more we know, the better we know what we do not know, and the more elaborate our risk awareness becomes. The more rationally we calculate and the more complex the calculations become, the more aspects come into view involving uncertainty about the future and thus risk.[60] Seen from this point of view, it is no accident that the risk perspective has developed parallel to the growth in scientific specialization. Modern risk-orientated society is a product not only of the perception of the consequences of technological achievement. Its seed is contained in the expansion of research possibilities and of knowledge itself.

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58 Exceptions must be allowed. Death is one such exception. For this reason there is strictly speaking no risk of death, but only the risk of your life being shortened. Whoever considers 'life' the highest value would thus be well advised to say: 'long life'.

59 For detailed treatment see Aaron Wildavsky, *Searching for Safety* (New Brunswick, 1988).

60 On this countermovement of rationality and risk see Klaus P. Japp, 'Soziologische Risikoforschung,' MS (1990).

IV.

In concluding this chapter we have still to take a brief look at the problem of *prevention*, which, as we will show in greater detail, mediates between decision and risk.

By prevention in this context we mean quite generally preparing for uncertain future losses by seeking to reduce either the probability of occurrence of losses or their extent. Prevention may thus be practised both in the case of danger and in the case of risk. We may arm ourselves even against dangers not attributable to our own decisions. We train in the use of weapons, make certain financial provisions for emergencies, or cultivate friends we can turn to if we need help. However, such security strategies are a side-show. The general motivation behind them is the realization that life in this world is fraught with uncertainty.

When, by contrast, we are dealing with risk, the situation is in significant respects a different one. For in this case prevention influences the willingness to take risks and thus affects one of the conditions for the occurrence of loss. If there is a more or less earthquake-proof method of construction, one will be more readily inclined to build in an earthquake-prone area. A bank is more willing to grant a loan if one can provide sufficient collateral. For the location of a nuclear power station the possibilities of rapidly evacuating the civil population (this put a stop to a project on Long Island) is a not unimportant aspect. But the cycle of reducing and increasing risk, determined by the 'be prepared' factor, goes far beyond this. Studies on the risk behaviour of managers have shown us that they demonstrate a not uncommon tendency to overestimate their control over the course of possible harmful developments; or even to stiffen their resolve by rejecting available data and procuring different, more favourable estimates.[61] In other words one actively seeks out confirmation of the assumption that the course of events will remain amenable to control.

Such behaviour can also be described as a risk distribution strategy. The primary risk of the decision – which is the first concern – is ab-

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61 See the research overview of James G. March and Zur Shapira, 'Managerial Perspectives on Risk and Risk Taking', *Management Science* 33 (1987), pp. 1404-1418 (1410 ff.)

sorbed, complemented, and weakened by a secondary risk, which, since it is also a risk, can in certain circumstances increase the primary risk. The additional and relief risk can consist in the preventive measures proving quite unnecessary: we toil day after day round the lake to keep fit only to meet our end in a plane crash. Or prevention proves to be causally ineffective. Or it is merely a useful supportive fiction. The risk-elimination risk remains a risk.

Since both primary risks and prevention risks are risks, both involve the problems of risk evaluation and acceptance. But their mutual dependence make it a complex matter and one that is for all intents and purposes unpredictable. It may well be that we see the prevention risk with different eyes and accepts it more willingly because it serves as security against a primary risk. We seek and find an alibi risk. We know the risks involved in technical installations and are therefore all the more willing to rely on the people employed to control such risks, or on redundancies of another sort.

Finally, the problem under discussion also has a political aspect.[62] For the political evaluation of acceptable, permissible risk, safety technology as well as all other measures taken to lessen the probability of losses occurring or to reduce losses or damage in the case of accidents will play a considerable role; the scope for negotiation will presumably be found in this field rather than in that of diverging opinions on the primary risk. But precisely this development takes politics into tricky territory. It is not only exposed to the usual over and underestimating of risks, which initially triggers the politicization of the topics, but also to distortions arising from the fact that one regards the primary risk as being controllable or uncontrollable depending on the result one is hoping to achieve. Every risk evaluation is and remains context bound. Neither psychologically nor under prevailing social conditions is there an abstract risk preference or lack of preference. But what happens if the context producing the risk evaluation is itself a further risk?

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62 See David Okrent, 'Comment on Societal Risk.' *Science*, 208 (1980), pp. 372-375 – a text based on a report by the author to the Subcommittee on Science, Research, and Technology of the US House of Representatives.

In conclusion we must take another look at the distinction of risk and danger in this context, and especially in relation to politics. Even if it is only a question of danger in the sense of natural disaster, the omission of prevention becomes a risk. It is apparently easier to distance oneself politically from dangers than from risks[63] – even where the probability of loss or the extent of loss is greater in the case of danger than in that of risk; and presumably also independently of the question (but this would require meticulous inquiry) of how reliable prevention in each case would be and what it would cost. Even if prevention is available for both types of situation, it may nevertheless be relevant whether the primary problem is treated as danger or risk. In Sweden it was politically opportune to evacuate a large number of Lapps by helicopter for the duration of missile testing in their area, although the probability and extent of loss in the event of a helicopter crash were far greater than the possibility that a single person in a sparsely inhabited area would be struck by falling missile debris. But the one case was apparently assessed as a risk, while the other (moreover quite incorrectly) only as a danger.

63 Okrent op. cit. discusses an example of this problem in industrial risks and flood risks in the American canyons.

Chapter 2
The Future as Risk

I.

Notions about time have no object independent of observation. As observations and descriptions of temporal relations, they are temporal observations and descriptions. This suggests that they are determined by the society that communicates about time and develops appropriate forms for this purpose. This much we can assume on the basis of what comparative cultural and linguistic research can tell us. The radical nature and theoretical relevance of this view do perhaps call for explanation. For it is not sufficient to put an end to the problem by labelling it 'relativism' or 'historicism'. We should, even if the phenomenon of time cannot be uniformly described, at least seek to elucidate the genetics of time.

The use made by different societies of a variety of time models and spatial metaphors for time has been discussed above all in terms of the difference between linear and cyclical notions of time. However, all attempts to assign entire civilizations to one or other of the two models (especially Egypt and Israel to the linear model and Greece to the cyclical one) have failed empirically. In ideating time, a society apparently needs not only spatial metaphors[1] but also distinctions. And once a certain stage of development has been reached, it presumably needs a number of distinctions – that is to say a distinction of distinctions.

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1 Their significance seems above all to have been in representing larger-scale spatial/temporal relations more distant from the point of time of experience – as if it were a question of being able to attribute space-analogous accessability/inaccessability to distant periods. Among numerous studies in ethnology and history of language, see Werner Müller, 'Raum und Zeit in Sprachen und Kalendern Nordamerikas und Alteuropas.' *Anthropos* 57 (1963), pp. 568-590.

In this connection the one that almost inevitably comes to mind is that of before and after, which still falls within the scope of perception. But this leads to the question: what is time when understood as the unity of the difference between before and after? The answer to this question must be mediated by a further distinction. In the old European tradition this function was performed by the concept of movement, seen as one side of a distinction that was then formulated as moving/stationary, as changing/unchanging, as tempus/aeternitas. And it was *this* framework that then made it possible to extrapolate 'before' to an extensive past and 'after' to an extensive future, which – according to Augustinus – met in the shadows (*occultum*) of eternal time.

We now know that this, too, was a culturally determined elaboration. In ancient Egypt we find no corresponding conceptualization,[2] and even when time is organized in terms of duration and transience, a wide range of interpretations is available. There is thus good reason to question whether modern society can continue to present its time semantics in this form; particularly after this time schema had been brought into intimate association, indeed congruence, with the code of religion, with the distinction of immanence (*tempus*) and transcendence (*aeternitas*).

To provide us with a basis for discussion in the face of this degree of disarray in time semantics, we shall contend that everything that happens happens simultaneously.[3] This also means that everything that happens does so for the first and last time. An observer may well be able to discern similarities, to recognize reiterations, to distinguish between before and after (for example, to establish distances in time or to attribute effects to causes), but he does this only with the aid of the distinctions he employs and only on the strict condition of his own (observation)-operations being simultaneous with everything else that occurs. If we translate this into systems-theory terminology, we

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2 See Jan Assmann, 'Das Doppelgesicht der Zeit im altägyptischen Denken.' In Anton Peisl and Armin Mohler, eds., *Die Zeit* (Munich, 1983), pp. 189-223.

3 For more detail see Niklas Luhmann, 'Gleichzeitigkeit und Synchronisation.' In Niklas Luhmann, *Soziologische Aufklärung*, Vol. 5 (Opladen, 1990), pp. 95-130.

would say that the environment of a system always exists simultaneously with the system – neither prior to nor subsequent to it. Thus it can never happen that the environment gets stuck, as it were, in the past, while the present of the system becomes the future of the environment (or vice versa). On the simple operative level time scarcely plays a role. What happens does so because the environment remains inaccessible anyway – because it exists simultaneously. For this reason all systems form themselves at this level as operatively closed systems. They can generate only their own sequent operations, which in their turn proceed simultaneously with the then given environment. In other words, at this level of elementary operation there is no problem of synchronization. All systems are synchronized by their very nature. And this applies for *all* systems, because no system can exist without elementary operations. With whatever speed or drive, to whatever degree of complexity and sophistication a system furthers itself, there is no avoiding this law of elementary simultaneity.[4]

The strict concentration on what can occur operatively brings us to another basic point. Recursively operating (operatively closed) systems proceed on the basis of the state they have attained. Their own operations are guided by their (immediate) past. They can gain no access to their future. Hence, they move backwards into the future. However, to the extent that they dispose of memory and thus of the ability to calculate consistent behaviour, interference from inconsistencies can occur. And just as binocular vision produces spatial depth for the purpose of resolving selfproduced visual inconsistencies, the ever more complex memory generates temporal depth in the form of the twin horizons of the past and the future. Although everything that happens does so simultaneously, memory-aided operations cannot take everything that they examine as being simultaneous, for this would lead to unbearable overlapping, to confusion, to inconsistency, and to disorientation. With memory the system is thus in a position to provide itself with temporal distinctions for the purpose of bringing

4 At this point we shall not broach the question of whether Einstein succeeded in resolving these conditions. We note only that this problem can be discussed only if one posits an observer and discovers in what sense *for him*, if he is called God or in some other way really exists, is subject to the fundamental law of simultaneity.

order to the self-generated disorder. The 'before' and 'after' of an event become discrete, and highly complex systems finally become capable of seeing the future in the mirror of the past and of orienting themselves by the difference between the past and the future.

Having gained the capacity to observe in this manner does not, however, alter the factual situation or modify operating conditions. The universal law of simultaneity also applies to the operation of making distinctions, and it does so in a particular sense. For the purpose of marking a form, as we mentioned in Chapter 1, the distinction presupposes that the *two* sides exist *simultaneously*. This is also true for the distinction of simultaneity and nonsimultaneity, with which we have already been operating implicitly. Systems that can do more by their operations than simply generate differences (as when the Sun warms the Earth), that are capable of drawing distinctions, find themselves in a particular relation to time. And this provides us with a point of departure for what follows.

Together with the simultaneity of the two sides of the distinction, the operation of drawing a distinction requires that the side of the distinction being indicated as the starting point for further operations be named. It is not possible to take both sides, for this would cancel out the sense of the distinction or would take us back to the question of what it is that we are distinguishing from what we are at the moment indicating as 'both'. In Spencer Brown's terminology, distinction and indication thus constitute a single operation, but an operation with a time structure that is complex in itself, and one that presents the observer with a paradox. To pass from the one (indicated) side to the other, we need to perform an operation – and to do so we need time. We must thus cross the boundary separating the two sides and constituting the form. To this extent the respective other side exists both simultaneously and nonsimultaneously. It is simultaneous as a coconstitutive element of the form. It is nonsimultaneous to the extent that in the operative utilization of the form (we refer to it as 'observation') it cannot be used simultaneously. The category of heterogeneity is a time form. The reflections of Nikolaus von Kues on the *non-aliud* were thus always reflections on the timelessness of God; and they could only be presented separately because, via the distinction of *tempus* and *aeternitas*, the form of time was already discrete.

Since all notions about time require distinctions – even if it is only the primary distinction of before and after – this fact alone presupposes time, if only in the paradoxical form of the simultaneity of nonsimultaneity. All time semantics thus takes as its starting point the paradox of time, and differs only in the form in which this paradox is developed – in the irreversible asymmetry of before and after, in spatial metaphors such as line and cycle and also in movement, in time-specific distinctions such as duration and transience, resultativity and virtuality, [5] or, finally, past and present. The historical and cultural relativity of all time semantics must be admitted; but it is not the final statement of a theory of time, incapable of further derivation. It is only a matter of different forms of developing a paradox, which in the final instance is nothing other than the paradox of the distinction, of the *unity* of a *two-sided form*.[6]

II.

The forms with which the paradox of time are developed cannot be chosen at will. The majority of distinctions and their logical nonderivability offer rather the possibility of coordinating time semantics with social structures. They offer the opportunity to adapt in this way to the structural limitations of meaning-formation, thus gaining in plausibility. It is this theoretical background that has led us to the thesis that modern society represents the future as risk. Distinctions that can be defined in the form (or by means of the form) of risk then serve to resolve the paradox of time. They distract attention from the fact that all nonsimultaneity (including that of present and future) exists simultaneously and only simultaneously.

Among the established positions of more recent historical research is that the temporal structures within which society describes itself changed radically in the transitional period leading up to the modern

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5 Thus Assmann l.c. for ancient Egypt.

6 On the subject of substituting connectable distinctions for a fundamental paradox (antinomy) see Nicholas Rescher, *The Strife of Systems: An Essay on the Grounds and Implications of Philosophical Diversity* (Pittsburgh, 1985).

era, especially in the course of the second half of the eighteenth century.[7] It is much more difficult to discover exactly what this change is. It is certainly incorrect to speak of it as constituting a shift from cyclical to linear notions of time. It is just as dubious to see the innovation as being that of an 'open' future; for it was after all always an open question whether one ended up in heaven or in hell. The discussion on finite versus infinite time horizons is, at least as a controversy, an old one; at most in the modern period we no longer believe that time as such will at some stage come to an end. But with the 'end of time' it is only the distinction of time and nontime that becomes obsolete, so that this, too, cannot characterize a specifically modern time awareness.

The thesis we shall advance is that in the modern period the difference between the past and the future takes control over time semantics and over the adaptation of this semantics to altered societal structures.

This does not of course mean that the distinction of past and future has only now been invented, nor that a concept of future is only now developing.[8] But of all the currently employed time-related distinctions, that of past and future seems best suited to harmonize notions of time with the simultaneous transformation of societal structures.

That the demands made on time semantics are subject to change is to be attributed partly to the development of printing, and partly to the emergence of a multitude of specialized function systems. Taken together, both changes put time under complex pressures. In particular, the printing press now revealed how much knowledge already existed simultaneously, so that new selection and classification requirements arose. The machinery to ensure consistency, the operatively accessible memory of the system, became so overloaded that more powerful material and temporal distinctions had to be found to re-establish order. Hence in about 1600 the system concept began its historical career. Moreover, it now made sense to produce new knowledge specifically for print, whereas in an earlier period it had already been an

7 See Reinhart Koselleck, *Vergangene Zukunft: Zur Semantik geschichtlicher Zeiten* (Frankfurt, 1979).

8 We may perhaps concede that linguistic singularization imposes itself. With regard to 'future' one now no longer thinks primarily of the things awaiting one: *à venir* becomes *avenir*, etc.

achievement simply to reproduce knowledge to preserve it from oblivion. In addition, the individual function systems now projected divergent time-horizons. The time of the merchant was not that of the monk; the time in which political intentions had to be kept secret was not the time that required a new theory to gain recognition. Calendars and clocks now measured rearguard positions from which one could continue to speak about the same time, whereas it previously served principally to determine what was to happen at fixed times.[9]

Already in antiquity the change in clothing customs had been discussed. To cover this phenomenon a new concept (*la mode* in contrast to *le mode*) arose towards the end of the sixteenth century, which proved amenable to generalization – being applied to such diverse fields as religious attitudes, linguistic habits, cooking, and educational travel. Covering all areas of thematic relevance, it explicates the phenomenon of opinion and habit that is limited in time but nonetheless binding for the duration of its term of validity. This in its turn converges with the necessity of taking into account role differentiation in the function systems.[10] It was recognized more and more that complexity has to be constructed successively (by the mid-eighteenth century this was even held to be apply to the Creation itself), and that there were advantages to be gained from a temporal (not only material) organization of complexity.[11] There are innumerable examples of this sort. As a result, the conceivable and cognizable discrepancy between past and future states of the world and of society increased. The old European cosmos of essences disintegrated, everything began to move and only the laws of nature that control this movement – espe-

9 See Eviatar Zerubavel, 'The Standardization of Time: A Sociological Perspective.' *American Journal of Sociology* 88 (1982), pp. 1-23; Eviatar Zerubavel, *Hidden Rhythms: Schedules and Calendars in Social Life* (Chicago, 1981).

10 In this connection see especially Ulrich Schulz-Buschhaus, 'La Bruyère und die Historizität der Moral: Bemerkung zu De la Mode 16.' *Romanistische Zeitschrift für Literaturgeschichte* 13 (1989), pp. 179-191.

11 See Niklas Luhmann, 'Temporalisierung von Komplexität: Zur Semantik neuzeitlicher Zeitbegriffe.' In Niklas Luhmann, *Gesellschaftsstruktur und Semantik*, Vol. 1 (Frankfurt, 1980), pp. 235-300.

cially the Newtonian laws – were for a while deemed to be invariant.[12]

Also in the second half of the eighteenth century, motivated by a new interest in history, people came to regard time itself as reflexive. The vantage point from which the totality of time could be simultaneously observed had previously been eternity, and the observer had been called God. Now it was each present that reflected on the totality of time in dividing it up between the past and the future of this particular present, and the observer was the human being. This then applies for *every* present, thus once again regardless of the flow of time, but in such a way that the totality of time appears *differently* in *each* present, namely with a distribution of pasts and futures (thus of times without *potential* and with potential) specific to each particular present. In each present past, one then sees past presents – with their specific pasts and futures. In the present future, one sees in corresponding perspective future presents, and thus sees the currently present present also as inalterable past.[13] In the present one can thus look forward to the future and from the future one will be able to look back at a present that will then be past; and one can already know now that the remembered present will not be the same as the current actual present. 'Er setzte,' it is said of Albano in Jean Paul's Titan, 'seine beleuchtete Gegenwart tief in eine künftige, schattige Vergangenheit hinein.'[14] All the more 'stress' we presume, in current parlance. At any rate, time reflects itself in time, and – this is the particular that

12 Towards the end of the nineteenth century Emile Boutroux will be found questioning this, too. See *De la contingence de lois de nature* (1874), quoted from the 8th edn. (Paris, 1915).

13 Rudiments of time forms of this structure are already to be found prior to the new historiography, above all in the field of spiritual guidance, where it was pointed out to the sinner that he could obtain salvation only in the present, and consequently had to live a life of consistent sin-aversion because eternity began with death (!). Then nothing could be changed. And the most effective form of repentance for those seeking salvation was also temporalized in this manner, because backsliding served to indicate that one *had* not truly repented.

14 'He laid his illuminated present deep into a future, shaded past.' Original quoted from Jean Paul, *Werke* (ed. Norbert Miller), Vol. II, 4th edn. (Munich, 1986), p. 322.

interests us – *does so on the basis of the fundamental distinction of past and future.*

It is certainly a factor contributing to the exacerbation of the discrepancy between the past and future that the past recalls specific events while the future is unable to anticipate in this way. Every attempt to specify causalities engenders ever greater difficulties. What will happen never depends on a single event. It is always a concatenation of circumstances, so that uncertainty multiplies in proportion to the rigour of the analysis. Within the horizon of the past one at least knows what has happened, even if causal relations remain unclear. Within the horizon of the future precisely this security is lacking – which, from a practical point of view, renders an analysis of causality superfluous. And for precisely this reason a mode of observation attaching importance to causalities exacerbates the discrepancy between the past and the future – especially since the reconciling notion of 'laws of causality' has become questionable.

If, however, the now dominant *distinction* of past and future is compatible with every *difference* between the past and the future, what has become of the present? The usual tripartite division of past, present, and future obscures the problem. It is still determined by the graphic image of movement, on the 'flow of time' or as Hegel would put it on the category of process. But the unity of time is not the unity of a movement; or at least we must free ourselves from this notion to the extent that it is no longer possible to describe this movement as the self-realization of the mind, as progress, or – in the sense of pre-Darwinian evolution theory – in some other way *as unity*. We must consequently remove the present from the two-sided form of time, from the distinction of past and future.[15] The Romantics were more or less aware of this. 'Nein,' we find in Titan, 'wir haben keine Gegenwart, die Vergangenheit muß ohne sie die Zukunft gebären.'[16] And in

15 The difficulty of this decision explains why neither the nineteenth nor the twentieth century has produced a convincing theory of the present, despite all the efforts undertaken in this direction. See Ingrid Oesterle, 'Der "Führungswechsel der Zeithorizonte" in der deutschen Literatur.' In Dirk Grathoff, ed., *Studien zur Ästhetik und Literaturgeschichte der Kunstperiode* (Frankfurt, 1985), pp. 11-75.

16 'No, we have no present, the past must bear the future without it.' Jean

Novalis we read: 'Daher ist alle Erinnerung wehmütig, alle Ahndung freudig'[17]. As a result the present is to be experienced as melancholy joy, thus as a paradox. The present is to be understood as the vantage point of the observer who observes time with the aid of the distinction of past and future. For this very reason *tertium non datur* must apply to his own observation. The present itself is – if we schematize time in this manner – the invisibility of time, the unobservability of observation. We may of course understand it as a stretch of time, but then the delimitation of this stretch remains arbitrary. And to the extent that is technically possible, we can reduce it in size and mark it anew by the boundary separating the past and the future. This does not alter the principle that if we observe time with the aid of the distinction drawn between the past and the future, the present remains the blind spot in this observation, the 'everywhere and nowhere' of this concept of time. Or, as we could also put it, the representation of the simultaneity of time.

This also makes the evaluation of risk dependent on the present. Like the present, evaluation of risk can shift in the course of time, and like the present it can reflect itself in the time horizons of the past and the future. There is no longer an objective vantage point for correct evaluation. With hindsight, we evaluate risk in terms of on whether a loss has occurred or not. When we look back, we no longer understand why in a present now belonging to the past we had been so cautious or, as the case may be, why we had made such a risky decision. And from out of the future another present stares us in the face, in which we will in retrospect certainly come to a different appraisal of the risk situation we are experiencing in this present. But how we will see it remains uncertain. Time itself engenders this difference in assessment; no amount of ever-present calculation can do anything to counteract it. In other words, it is part of the riskiness of risk that the way it is evaluated varies in the course of time. Risk calculation forms

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Paul, *Titan*, original quoted from *Werke in drei Bänden* (ed. Norbert Miller), 4th edn. (Munich, 1986), p. 478.

17 'Therefore all memory is melancholy, all foresight joy.' original quoted from Novalis, 'Blüthenstaub Nr. 109,' *Werke, Tagebücher und Briefe Friedrich von Hardenbergs*, (eds. Joachim Mähl and Richard Samuel) (Darmstadt, 1978), pp. 227-285 (283)

part of a historical machine that always proceeds on the basis of its present state, that clings to accepted or rejected risks too long, revises judgement after the event or, anticipating that this can happen, becomes still more uncertain of itself. The injunction contained in modern time structuring with its dual modality to draw a distinction between past, present and future presents, and thus to discount the past and future horizons of the operative present, encourages a thinking no longer amenable to any rational calculus. It has to reckon with too many possible system states.

III.

These still very general considerations allow us to make further assumptions on the way risk is handled. We shall start by putting the problem differently. By positing a past and a future, the present is constituted as a determination of time, to be more precise as a *restriction* that is necessary to link up the past with the future.[18] Why, however, is restriction not simply understood as a factor in a world that is simultaneous and thus not open to influence, but rather as a necessity imposed by having to make decisions without the needed information – and hence as risk?

This seems to have something to do with the cleft between the past and the future.[19] If the future is highly likely to differ from the past (why otherwise so dramatize this distinction?), and if there is no time in the present, how do we turn the page from the past to the future – blindly? We will see that – and how – the attempt is made to avoid at least this consequence, or to denounce it as 'decisionism'. However, what remains – as the irreducible residue after every counteractive effort at orderly execution – is precisely what we refer to as risk.

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18 'Die gewöhnliche Gegenwart' as Novalis puts it, op. cit. p. 283, 'verknüpft Vergangenheit und Zukunft durch Beschränkung'('The ordinary present connects the past and the future by restriction').

19 This is, of course, a circular relationship of mutual dependence. Thus in the last resort this problem is relegated to evolution theory, which manages without independent causes.

We could focus the history of rationality over recent centuries since *auctoritas, non veritas facit legem* on this point. It would be worth the effort, but it would divert our attention from our principal topic. At all events, hope in rationality declines as the recognition grows that one does not have the time required to obtain the necessary information. Argumentation theory also comes to grief on this point; at least Habermas and other representatives of this hope have not ventured to declare the speed of argumentation to be a critical variable.

Be that as it may, in the transitional period heralding the modern era, dependence on decision making and thus the value of paying attention to the future increases. Much that had used to happen more or less of its own accord in the course of life now requires the making of decisions – and against a background of a greater range of choice, thus with higher information values. In this connection it is inevitable to think in the first place of technological developments and hence of the increase in production options. But this is true only for part of what has happened, and moreover for a part that took effect only relatively late. In contrast to what one might expect, the development of production technologies has depended less on scientific progress than on the development of the relevant markets and capital reserves (including the willingness to incur debt). But there are many other cases. We could mention, for example, the incursion of state-planned statutory law (or similarly common law as transformed by judges for the purpose of modifying society) into unwritten local customary law – a process that began in Europe as long ago as the sixteenth century. Or, as medical knowledge of chemistry and biology develops (and if we consider the case of cancer, we see that this does not necessarily hold for therapeutic techniques), disease is transformed from an ever-present danger into a risk relating to one's way of life.[20] As mar-

20 From the point of view of medical history, this is no new problem. Eating habits, the consumption of luxury goods, sexual practices, etc. have always been under discussion as causing disease. What has changed is the degree to which statistically valid knowledge (not necessarily applicable to a particular case) confirms these links – or give the all-clear. On the one hand this partitions off risk perception from religious or social prejudice, while on the other hand the doctors intervene in daily life with their warnings and advice on prophylaxis (or at least this falls within their

riage – and in a later period informal intimate relations – are freed from social constraint, failure makes its appearance in partnerships as a risk to be weighed up beforehand. To prevent this in its turn, love takes on the form of 'passion' and is treated as irresistible. The problem then becomes more than ever a matter of a personal decision in favour of one particular partner, and anyone can then find himself (or herself) obliged to admit that what he or she had wanted had not been the right thing.[21] Where arranging marriages was not the business of the parents anyway, older literature regarded this as a purely male problem.[22] Nowadays the equality of the sexes has led to the risk being distributed evenly between the two sexes.

We could also draw attention to conditions in the money economy, where variable prices make all economic behaviour a risk: both investment and speculation, both selling and not selling property, both the choice of an occupation and the choice of an employer or vice versa, the appointment of personnel, and finally both the granting and the taking of loans.[23] This also removes the choice of a profession from the family tradition to become a decision independent of origin and the laws of inheritance. If this is so, then every learning process involves a decision with the risk of later being able to use what has been

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sphere of responsibility), without them being able to count on people's willingness to follow their counsel. And this means that risk perception and the burden of decision making in matters of health are shifted into everyday life.

21 See Willard Waller, *The Old Love and the New: Divorce and Readjustment* (1930), (reprint Carbondale, 1967).

22 Given the extreme improbability of ever finding a good wife, the literature discusses at great length how men can be persuaded at all to fulfil God's will (be fruitful and multiply!) and enter wedlock. See, e.g., Levinus Lemnius, *De miraculis occultis naturae libri IIII*, (Antwerp, 1574), IV.XIII, p. 410; Melchior Iunius Wittenbergensis, *Politicarum Quaestionum centum ac tredecim* (Frankfurt, 1606), Pars II, p. 12 ff.; Jacques Chaussé, Sieur de La Ferrière, *Traité de l'excellence du marriage: de sa necessité, et des moyens d'y vivre heureux, ou l'on fait l'apologie des femmes contre les calomnies des hommes* (Paris, 1685).

23 See Dirk Baecker, *Information und Risiko in der Marktwirtschaft* (Frankfurt, 1988.)

learned either not at all or only as what German educationists prefer to call *Bildung*.

These changes mentioned here only in excerpt show the societal range of a new type of phenomenon. The novelty, however, lies not in the feasibility, in the capacity of systematically shaping societal conditions. We need only recall the accounts of the foundation of cities in antiquity[24] to realize that, given the greater complexity and broader range of possibilities, we can do not more but less in this respect than could the ancients. The novelty lies uniquely in the expansion of the decision-making potential, in its more complex ramifications, in its greater wealth of alternatives. Translated into the conceptual language we are proposing, this leads to a transformation of dangers into risks. More and more states – whether existing or aspired to – are seen as being consequent to decisions, i.e. are attributed to decisions. Much is due to the dual intervention of the more pervasive technological development and more pronounced individualization of entities and processes formerly regarded as constituting Nature. We should, however, also remember the institution of insurance, which can be understood as an agent for transforming dangers and risks – into the risk of not having taken out insurance coverage. This in no way correlates to greater security in attaining goals. On the contrary, the concept of purpose itself is, to coin a term, 'deteleologized'. Imputing purposes and intentions (and in this sense 'finalizing') only serves to facilitate observation (even of animals, indeed, even of complex data processing machines) in cases where the behaviour of the system cannot be predicted.[25] In this connection, standards of rationality generally guaranteed by society – for instance in the sense of what used to be referred to as 'ethos' – have poor prospects. Professional standards for acceptable risk may well continue to exist, for instance for the surgeon's operating risk or for the useful life of buildings under conditions of normal utilization. On the stock market or in the banking system general experience condenses, signalling where the limits to

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24 For a survey see John Nicholas Goldstream, 'The Formation of the Greek Polis: Aristotle and Archaeology.' *Vorträge der Rheinisch-Westfälischen Akademie der Wissenschaften* G 272 (Opladen, 1984).

25 See Henri Atlan, *A tort et à raison: Intercritique de la science et du mythe* (Paris, 1986), p. 85 ff.

acceptable risk lie, or making available graduated types of speculative transaction. It would thus be wrong to reduce the problem addressed at this point to the dimension of the distinction between the rational and the irrational. But what can be achieved in this way is necessarily limited in the possible scale of the problems tackled, and must thus forego any claim to labels such as 'ethics' – indicative of overall societal commitment. In this situation the call for an 'ethical' solution to problems heard in all quarters nowadays remains a compensatory postulate.

If more and more has to be attributed to decisions, this almost automatically reinforces the difference between the past and the future. The first-order observer (including the person making the decision himself) understands decisions as being produced by this difference. They are therefore expected to be rational. An observer of the second order need not share this attitude; but he, too, sees that attribution to decisions makes the difference between the past and the future *perceptible*; or in other words, tempts one to see less continuity and more discontinuity than before. It is still a controversial question whether the French Revolution brought about any changes in societal conditions[26]; but there is no denying that the observation of this decision and its consequent decision exercised enormous influence *as observation*, and in particular cast a searching light on the discrepancy between the now past and the future ('constitutional') societal order. And it was only then that it become irrevocably clear that one was living in a societal formation different from any other mankind had ever known.

But modern society had not yet become perceptible in its structural reality, not to mention the consequences of this realization. One could be guided only by hopes relating to the consequences of abolishing class/legal differentiation – that is to say by value concepts such as liberty and equality. The Romantics, who were the first to grapple with this dualism, subjectivized the problem: they looked – to quote Novalis again – to the past with melancholy and the future with joyful foresight – but did not yet see the present as decision. Thus by reason

26 From among a copious literature on the subject see Rolf Reichardt and Eberhard Schmitt, 'Die Französische Revolution – Umbruch oder Kontinutität.' *Zeitschrift für historische Forschung* 7 (1980), pp. 257-320.

of a change in societal structures that was in the final resort unobservable, the future gained primacy over the past. At the same time the notorious ideological controversies arose, kindled initially on the revolution itself and – since the twenties of the nineteenth century – progressively stoked up by the effects of incipient industrialization. Now, having taken the form of a presentation of unity by controversy, they are consequently in quest of new subject matter: ecology, the situation of women, new ethnic groups, regional autonomies, and such like. This contains ever more urgently an injunction to understand the present as the making of, or failure to make decisions. We shall be returning to this point.

At the moment we are interested only in an abstract point of view: since we cannot know the future (or it would not be the future) and since, because of its structural novelty, we cannot describe the society in which we now live, a peculiar symbiosis arises between the future and society, that is to say, between certain uncertainties in the temporal dimension and in the social dimension. As a result, this appears to mean that the future can now be perceived only through the medium of probability, thus in all its characteristics as more or less probable or more or less improbable.[27] For the present this means that no one is in a position to claim knowledge of the future nor the capacity to change it. Living together in society requires doing without this type of authority. In the nineteenth and twentieth centuries attempts had still been made to capture this symbiosis of temporal dimension and social dimension in semantic formulas in order to guarantee order with prescience – in aetiological or dialectical form, via planning or evolution, with specific belief in progress or with quite indeterminate directional notions, with revolutionary (abrupt) or reformist (small-scale) notions of threshold. Probabilistic calculation has frequently been

27 A remarkable confirmation of the thesis is to be seen in changes to the legal system affecting liability for permissible but eventually damaging conduct. George L. Priest, 'The New Legal Structure of Risk control.' *Daedalus* 119(4) (1990), pp. 207-227, sums up this trend to the effect that the strict interpretation of individually attributable fault and provable causality have been abandoned, and that eventual liability can be established merely on the grounds of *the probability of having increased a loss.*

used in an effort to provide the present with a consensual basis on which decisions can be made. However, such calculation fails precisely in this function, precisely from the social point of view. This becomes apparent in the representation of probabilities in the temporal or spatial dimension. Even if one knows that a nuclear power station explodes only once every twelve million years, it can nevertheless happen tomorrow, and tomorrow it can once again happen tomorrow. Even if one knows that one suffers a fatal accident driving on the motorway only every twelve million kilometres, death could still be waiting round the next bend. In social evaluation, the calculus leaves all eventualities open for the individual case and the assessment of the risk will naturally differ depending on whether one feels that the accident could occur very soon or probably only at the end of the entire stretch.

The unity of the world of the nineteenth and twentieth centuries lies in an alliance of temporal dimension and social dimension that profited from the underdeveloped specificity of both. At the same time hopes were set in the possibilities of rational coupling, whether by means of recognizable regularities or statistical calculation. At the end of our century, however, we face the question: Is this still our world? Can we continue like this?

Chapter 3
Time Binding: Material and Social Aspects

I.

In this chapter we turn to very general assumptions about different dimensions of sensory experience and action.[1] The reason is that the concept of risk indicates a form for confronting the problem represented by the future, i.e., it is a form for dealing with time; and we may assume that this form cannot be used without taking into account the subject matter and without taking into account the social consequences. Thus we wish initially to introduce three dimension of sensory observation and description, which in their turn are constructed by means of distinctions specific to each of them. The temporal dimension, the material dimension, and the social dimension of sensory information processing are thus established at the level on which distinctions between distinctions are made. This at the same time impinges on historical problems. The extent to which these dimensions are separated and the treatment of the remaining mutual implications and of those generated in the first place by this separation are to be understood as a result of societal evolution.

These dimensions of meaning can be described as forms of observing the world with the aid of certain distinctions. By observing the 'world' we mean that it is not a matter of observing certain things or events, but that universal 'earthly' application is ensured (however, this may then be denied – in the temporal dimension, for example, by the category of eternity). The temporal dimension is used when something is to be observed with the aid of the distinction drawn between 'before' and 'after'. The material dimension permits observation with the help of 'forms', that is to say with the aid of distinctions that are regarded as given when indicating something specific. The most im-

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1 Detailed treatment in Niklas Luhmann, *Soziale Systeme: Grundriß einer allgemeinen Theorie* (Frankfurt, 1984), p. 111 ff.

portant instance for our purposes, being the one that enables us to draw distinctions in the first place, is that between a system and its environment. The social dimension arises as a discrete mode of observation when the distinction of 'ego' and 'alter' is deployed. It is not, as was formerly believed, a matter of relations between persons, who for their part are described materially as things (*res*), living beings (*animales*), etc., but a question of primary duplication for the process of communication in which *each party always* participates in *both* roles, as both 'ego' and as 'alter'.[2]

For the purpose of risk analysis and in dealing with related (we would say functionally equivalent) matters, we shall take the concept of *time binding* as our point of departure.[3] The concept, which has been adopted from linguistic theory and generalized in this context, indicates a problem and thus a starting point for the comparison of different, but from this point of view functionally equivalent solutions. Although time itself cannot be bound, it can bind by giving events structural value. To put it more precisely: events pass as soon as they come into being. They have no duration (otherwise we would speak of states, however brief these might be). But connecting operations can repeat them. This gives rise to a dual effect. On the one hand a meaning of the event has to be identified so that we can recognize reiteration for what it is. On the other hand, this happens in ever changing situations, so that our learning is compounded – one can fall asleep not only in the bedroom, but since the advent of television in

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2 Ranulph Glanville, *Objekte* (Berlin, 1988), taking up analyses of the immanent circularity of cybernetic control processes, goes so far as to consider this to be *per se* a necessary form of observable objects. Others speak of a necessary capacity for dialogue between or mutuality of social systems. Contrary to all the assumptions of committed opponents of systems theory, a conceptually radical understanding of the social is to be found precisely in systems theory, whereas phenomenology is able to describe the social only as a phenomenon, and argumentation theory concerns itself only with derived problems, principally with the secondary distinction of consensus and dissent.

3 As far as we know, the concept was coined by Alfred Korzybski, *Science and Sanity: An Introduction to Non-Aristotelian Systems and General Semantics*, (1933), quoted from the reprint of the 4th edn. (Lakeville, Conn., 1958).

the living room as well.[4] In our context the concept of time binding shall indicate the generation of structures in the autopoietic process of continuous self-renewal of the system, thus not simply the coming into being of factual states (atoms, suns, ozone hole, etc.) of some duration. The societal problem presented by such instances of time binding appears to be that they lay claim to material and social meaning, thus altering forms and influencing social distributions. It is quickly apparent that risky behaviour falls under this category. But there are other, much better known cases with a much longer history behind them, and which are consequently far more advanced institutionally. We are thinking of norms, and of regulations governing access to scarce commodities – thus of the law and the economy. In the present chapter we are concerned with comparing these different forms of time binding.

II.

The tradition of jurisprudence deals with legal problems from the point of view of the validity of norms, the function of which is to permit decisions on the distinction between right and wrong. In other words, we must first know which norms are in force before we can decide when conduct is lawful and when it is unlawful. This treatment of legal matters is not to be criticized. It is all that is needed to mark off the legal system from other types of system (such as politics and religion) and to keep it in operation. For a comparison of norms, scarcity, and risk, however, it is not enough.

It is also insufficient, in the sense of an almost centenarian tradition, to distinguish between the juridical and sociological treatment of legal matters as between questions of validity and ontology, between

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4 George Spencer Brown, *Laws of Form*, quoted from the reprint (New York, 1979), p. 10 correspondingly distinguishes 'condensation' and 'confirmation' depending on whether the substitution rule is read from left to right or from right to left; also depending on whether several equivalent symbols are substituted for one (condensed) or vice versa one is substituted for several (confirmed). In the mathematical context of this calculus, however, the learning effect mentioned above plays no role.

norms and facts. We must seek different theoretical bases.[5] For our present purposes excerpts will serve, for it is only a matter of recognizing the specific form in which the law binds time.

From the point of view of implementation, norms are rules on decison-making, which (like all rules) are valid for more than one case. From the point of view of validity, norms are established rules, the basis for the validity of which – depending on the prevailing spirit of the period – can be sought, found, and judged in nature, morality, legitimizing values, and finally in positive law itself. From the point of view of function, they are time binding forms. A norm stabilizes expectations, also and in particular where conduct is unexpected. Where norms are violated, it is not the expectation but the conduct that is wrong. Although one can have erred in respect of the facts, one has not done so on the normative side of expectation. In other words, the violation of the norm offers no occasion for amending it, no occasion for learning; it condenses and confirms expectation[6] in providing an occasion to activate and confirm it.

The conceptual approach introduced in the previous paragraph makes a number of additional explanations possible. Norms are forms of time binding, and are indeed already quite complex forms.[7] They project an expectation on the future – to be precise a non-self-evident (contingent, open-to-disappointment) expectation. Within the domain of the self-evident (for instance, that it takes time to move through space), there is no formation of norms. Contingency is also indispensable. *Necessitas non habet legem.* The danger of expectation being disappointed is resolved (developed, confirmed) in the form of the norm, namely in the distinction made between conforming and de-

5 See also Niklas Luhmann, *Die soziologische Beobachtung des Rechts* (Frankfurt, 1986).

6 Our formulation follows Spencer Brown. See above note.... In the sociological literature we find similar views in Durkheim.

7 For this reason we may not assume that norms already exist in all primitive cultures. In early forms of societal development there is no means of distinguishing between the quality of actions and rules vested with independent validity. This does not mean (as is sometimes imputed) that societies at this stage know no law. The law can, however, be recognized only in the qualities of action itself and can therefore be neither isolated nor developed in its specific forms.

viant conduct. The meaning of this distinction lies in its being capable of confirmation as form by both conformable and deviant conduct. And this is precisely what defines a distinction between this distinction and others, above all those that impute a learning process in cases of disappointment.[8]

From the perspective of the person observing within the norm schema, risk ought to be exclusively in deviance from the norm. To emphasize this, the norm is provided with external (legal) and internal (moral) sanctions. The risk projection accompanying the norm is imputed also to the person deviating therefrom. The moment he observes his own conduct in the norm-schema he will experience his action as risky. The norm itself is presupposed as a risk-free structure. Even where law has been fully positivized it is still regarded in this light – the norm is valid for as long as it is valid. If disadvantages arise or preferences change, it can be amended. But as long as it is valid there is no risk in being guided by it.

Structures, however, arise from operations. Operations are events bound to points in time. Norms are thus not the outcome of a self-explication of reason, but the outcome of form building in autopoietic systems already structurally determined. Events suggest expectations that are for the most part attributable to the situation, that are forgotten or recalled only in relation to the situation. In certain circumstances they can, however, also be generalized and then have to be protected against the danger of being disappointed. The problem with which we are concerned is that this cannot happen without definition in both material and social respects. Expectations have to be given a form, so that they can be recognized again and – a more exigent de-

8 We will simply point out at this stage that combinative forms can ensue. It can for example, be normatively expected that in certain situations one has to learn and cannot insist on the fulfilment of expectation. Or that normative expectations must in their turn be cognitively learned to the level of full professionalization of the corresponding knowledge. It can also be made subject to norm that the amendment of norms (for instance by legislation) be treated and correspondingly learned as a cogitative problem. This encapsulation of modes of expectation at the same time demonstrates that the legal culture with which we are familiar today is a highly complex late phase in a long evolution, and for this very reason does not show structures that can be legitimized by reference to 'values'.

mand – so that a distinction can be drawn between conformable and deviant conduct. Moreover, there is the social problem that the expectations of 'ego' relate the behaviour of 'alter' to the right/wrong schema, although 'alter' perhaps has something quite different in mind than submitting to the norm or contravening it; perhaps it wants to do only what it happens to feel like doing, wants to satisfy a need, wants to draw attention to itself, or whatever. The time binding effect of normalization thus has both a material and a social side to it, and only if and to the extent that this is taken into account, can the resulting form be referred to as law.[9] In other words, if a system binds time, this has a selective effect on the content and the social forms rendering it possible. Law is one of the outcomes of such a combinative selection.

As soon as this machinery of distinctions is available, a specific legal system can emerge and an individual legal culture can condense. It is an indispensable prerequisite that the binary code right/wrong can be held constant in the face of all changes to the system's legal norms and procedures; for this system differs from other systems by its concern with the question of 'right and wrong'. Such a system then gathers experience with its own operations, corrects itself, hypercorrects itself by repeatedly refining refinements, by developing distinctions (such as ownership and possession, leasehold and freehold, various forms of compensation for errors) the meaning and practical consequences of which are then comprehensible only to the professional expert. This in its turn requires that law be taught, it engenders what the Romans then called 'institutions' and transforms rights of action (*actiones*), initially developed as means of taking legal action, into a set of systematically coordinated concepts. The legal system becomes autonomous in the sense that externally it can be altered only by deploying legally appropriate forms, thus only by self-amendment. However, this does not affect the basic conditions that make such autogenous evolution possible in the first place. It neither influences the form – fixated on the disappointment problem – of the norm that re-

9 In this sense we can speak of temporally, materially and socially congruent generalization of expectation. See Niklas Luhmann, A Sociological Theory of Law, E. King-Utz and Martin Albrow, trans. (RCH, 1985), p. 94 ff.

tains its validity despite material contradiction, nor the social breaching of this rigidity by means of binary coding, so that only one party to litigation can be in the right while the other has necessarily to be in the wrong.[10]

The social dimension of this legal time binding is normally represented inaccurately – especially by the friends of reason among legal philosophers – or at any rate too superficially. The problem involved is neither one of consensus, nor is it a matter of establishing reasonable criteria on the basis of which the observer may determine whether someone has to grant consent/permit consensus or not. All these notions cannot stand up to second-order observation. But the recourse to physical coercion and the corresponding capacity for enforcement usual since the eighteenth century also share the same superficiality of a final argument that describes a reality in which there is no 'real end' but merely a provisional binding of time. More convincing is the representation of the problem as one of sovereignty, a view more common in the sixteenth and seventeenth centuries. A much discussed paradigm was the situation of Romulus and Remus.[11] The city was given a wall. This led to the question of whether one might cross it without further ado. Romulus forbade it. This forced Remus to decide between obedience or disobedience. The outcome is known: the city is called Rome and not Reme. One cannot establish a norm without restricting the behaviour of others. Every binding of time has social costs. All other questions are secondary and can be neither formulated nor answered if one does not take into account the historical factor of the structurally determined system society.

The normative regulation of time binding was formerly broader in scope than it is today. One could conceive of natural law; that is to say

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10 This can be compared to the typical course of events in Greek tragedy, where it is precisely the pursuit of one's own rights or also the punishment of injustice that leads to wrongdoing via a sequence of deeds in which right is always simultaneously wrong until the Areopagus is called upon to separate right from wrong in such a way that they then have to be guaranteed politically (civically), thus distinguishing political society from the household.

11 See Niccolò Machiavelli, *Discorsi sopra la prima Deca di Tito Livio I*, quoted from *Opere* (Milan, 1976), p. 148 ff.

taking a normative concept of nature as a basis.[12] The more pronounced specific elaboration of the legal system on the one side and of the natural sciences on the other has shattered this concept of nature. Initially one had argued on the basis of convention, of the recognizability of the advantage of an orderly way of life, or also on the basis of the experience of lawyers as proved by the centuries (artificial reason!). However, there was always the insoluble problem that in individual cases it can be rational not to adhere to the norm simply because others do so.[13] If we take as our point of departure an anthropological-individualistic understanding of rationality, it does not appear to be rational to accept legal norms – to resign oneself to the social costs of time binding – without weighing one's own advantages and disadvantages. Today such problems are covered by the metaphorical term of 'free-riding'. Disregarding such exaggerations, the problem remains one of the expectation content of norms, of stamping as unlawful conduct or behaviour that in certain circumstances is desirable and advantageous. To some extent the functions of the nature concept or of generalized convention have been taken over by statistics, which seeks to evidence that what might not apply in individual instances can on the whole be correct. To some extent these functions are exercised by the resistance opposed by positive law to change and by the resilience of its validity despite repeated violation of its norms. However, one thus waives any justification of validity, being satisfied simply to establish that restrictions on conduct are required and enforced to a satisfactory degree.

Such restrictions may be regarded as the precondition for the development of autonomous complexity and an autonomous dynamic within a specific function system. But however complex, cumber-

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12 The fact that lawyers and in particular legal philosophers still speak of 'natural law' must be noted as a singularity. This is a usage of the term that has nothing more to do with the usual concept of nature, but which is used by lawyers to cover the residual risk of their profession.

13 See also the (not very convincing) treatment of this topic in David Hume, *A Treatise on Human Nature*, Book III, Part II, Sections I and II, quoted from the Everyman's Library edition (London, 1956), Vol. 2, p. 184 ff. See Gerald J. Postema, *Bentham and the Common Law Tradition* (Oxford, 1986), p. 134 ff.

some and diversified law may be, and in whichever manner it may be considered as an instance of rationality that veers towards irrationality, or which may attain extreme values in both directions simultaneously, the law condenses as a specific form of time binding, solving its particular problem (whatever we may think of individual laws and judicial decisions), and disregarding other time binding problems. We can thus hardly expect that risk problems, if they are problems of time binding, can be solved within the framework of suitable legal forms. *For in the case of risks we are not dealing with a future for which we can in our present determine how others are to behave in future situations.* A risk cannot be violated. If the law can be expected to assume risks, this can only occur by detemporalizing the assessment of what is right and wrong. In other words, symbols such as legal force or legal validity have to be deployed with 'binding' effect regardless of whether the future proves a decision right or wrong. It is the typical concern of a normative orientation to be able to know now what expectations one will be able to sustain in the future.

This injunction to maintain neutrality is, however, violated if the decision itself is justified by its presumed consequences. Although it can then still formally claim validity, such justification opens the back door to the parasite of paradox. On the one hand the decision is valid because certain future consequences are foreseen, or at any rate provide justification for making the decision in question – at the legislative level and at that of judicial decision. On the other hand, the symbol of validity signals that this is irrelevant and that the decision will continue to be valid even if quite unexpected developments occur that prove the decision wrong. The law can indeed help out by means of procedures for a new decision; but this changes nothing in the fact that, with hindsight, the decision to be revised was based on wrong expectations and its legal consequences, being coagulated past, can no longer be approved.

An orientation towards consequences is today the most frequent – indeed almost the only – principle on which decisions are justified.[14]

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14 See Thomas W. Wälde, *Juristische Folgenorientierung: 'Policy Analysis' und Sozialkybernetik: Methodische und organisatorische Überlegungen zur Bewältigung der Folgenorientierung im Rechtssystem* (Frankfurt, 1979); Gertrude Lübbe-Wolff, *Rechtsfolgen und Realfolgen: Welche*

All criticism thereof is rejected. Today no-one would put his money on Kant and venture to state: 'Die Folgen der Handlung in der Erfahrung können nur das *Angenehme* oder *Unangenehme* derselben für das Gefühl lehren und dadurch *Vorschriften* der *Klugheit* darbieten. Aber der Begriff eines *Rechts* und einer *Verbindlichkeit* läßt sich nicht aus ihnen einsehen'.[15] The fact of consequence orientated legal practice and its from a Kantian point of view pragmatic wisdom cannot be overlooked. But from a logical point of view it amounts to a paradoxical justification of law, and from a sociological point of view it is a symptom that law is expected to assume and process risk, which the form of the legal norm is at a loss to cope with.

This conversion to consequence orientation, with its problematical obligation to bring the future into the present, affects more or less all sectors of the law.[16] In addition there are special problems in which

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Rollen können Folgenerwägungen in der juristischen Regel- und Begriffsbildung spielen? (Freiburg, 1981). The discussion in common-law legal theory, concentrating more on the individual decision, has also clearly tackled the problem and has to some extent reacted by demanding a restriction on law-immanent consequences, complemented, however, by deployment of a no less problematic 'institutional morality'. See for example, Neil MacCormick, *Legal Reasoning and Legal Theory* (Oxford, 1978); Bernard Rudden, 'Consequences.' *Juridical Review* 24 (1979), pp. 193-201; Neil MacCormick, 'Legal Decisions and Their Consequences: From Dewey to Dworkin' *New York University Law Review* 58 (1983), pp. 239-258. United States common law is at present nurturing the theory of an economic analysis of law, a theoretically hitherto rather neglected field operating with the injunction of consequence calculus and shifting the weight of controversy on methodological questions on to this calculus. Thus rationality is sought in a radical manner in a domain where it is really a matter of risk.

15 'The consequences of an action for experience can only teach us the pleasantness or unpleasantness of the same for our sensibility, and thus provide rules of good sense. But the concept of law and of obligation cannot be derived therefrom.' Johann Gottlieb Buhle. Original quoted from *Lehrbuch des Naturrechts* (Göttingen, 1798), reprint Brussels 1969, p. 51.

16 There are understandably certain reservations in respect of criminal law. See, for example, Winfried Hassemer, 'Über die Berücksichtigung von

the inroads made by risk orientation into the field of law become particularly evident. For example, in the law relating to liability, and in particular strict liability. The problem here is that action is permissible, and thus *lawful*, but in the event of loss *nevertheless* renders the actor liable to damages.[17] The policy reason is naturally that under modern conditions one would otherwise have to prohibit, and thus make unlawful, more and more behaviour, even though typically no loss is to be expected. In other words it is a question of granting a possible originator of a loss the freedom to calculate his risk but also to give up. This, however, impinges on the clear-cut code of right/wrong and restricts its orientation value. Whereas old dogma upheld strict rules such as *casum sentit dominus* or *qui suo iure utitur neminem laedit*, one now has to deal with the conflict of rightful interests that cannot be settled by means of a general attribution to right or wrong, but which have come to depend on the chance of occurrence or nonoccurrence of loss. And whereas special problems relating to the conflict of rightful interests and related compensation problems used to be rare exceptions,[18] the entry made by the risk problematic

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Folgen bei der Auslegung der Strafgesetze.' *Festschrift Helmut Coing* (Munich, 1982), pp. 493-524.

17 See the classical monograph by Josef Esser, *Grundlagen und Entwicklung der Gefährdungshaftung: Beiträge zur Reform des Haftpflichtrechts und zu seiner Wiedereinordnung in die Gedanken des allgemeinen Privatrechts* (Munich, 1941), and for the more recent environmental policy discussion, e.g., Michael Klöpfer, 'Umweltrisiken und Haftungsregeln – Rechtspolitische Aspekte.' *Zeitschrift für Umweltpolitik und Umweltrecht* 11 (1988), pp. 243-258.

18 A well-known exception was the law relating to expropriation. Another, more important in civil law systems, was the law relating to public emergencies. On the latter (considering the possibilities of analogous application) see Rudolf Merkel, *Die Kollision rechtmäßiger Interessen und die Schadensersatzpflicht bei rechtmäßigen Handlungen* (Strasburg, 1895). It is worth noting that this case had given rise to a comprehensive discussion of the necessity of a 'balancing of interests' (op. cit., p. 49 ff.), just as if the balancing formula, juridically hardly amenable to precision, always comes into play when (and nowadays to excess) when the law is unable to couch its decision in the strict form of the distinction of rightful and wrongful conduct.

into the domain of the law has given these borderline cases far wider significance. As with consequence orientation, we also gain the impression here that the law is being overtaxed by bringing the future into the present as a legal form, and is searching for forms that nevertheless remain justiciable to some degree. We will be taking up these matters again when treating the question of whether and how politics can rid itself of its own risk either by reworking it into legal forms or at least postponing it until such time as the particular legal regulation once again becomes a subject of debate.[19]

III.

In the case of *scarcity* we have a quite different future-related problem, and consequently a quite different way of binding time. Where the means for satisfying needs are scarce, one would like to secure access thereto not only for today but also for tomorrow and the day after tomorrow. However, scarcity means that access (the classical term is *occupatio*) for one is at the cost of access for others. This may be tolerable if tomorrow is another day giving someone else a turn. However, the more each person seeks to take precautions against scarcity for a longer period, the greater will be the scarcity for others where quantities remain constant. Scarcity is thus one of those problems that become a paradox if seen as a social problem: the less scarcity there is (for one), the more scarcity there is (for others).[20]

This does not exhaust the circularity of the problem nor its capacity for escalation. If one develops foreign trade and establishes sales markets (for example, in the fur trade), local goods – which have previously been in abundant supply in a self-sufficient economy – become scarce because one can now earn money with them, thus being able to overcome scarcity. When one takes up organized industrial production, capital has to be concentrated, that is to say, has to be withdrawn from consumption. In this way new scarcities are constantly arising, including the extreme case of a paradoxical scarcity of opportunity to

19 See Chapter 8 V.

20 See also Niklas Luhmann, *Die Wirtschaft der Gesellschaft* (Frankfurt, 1988), p. 177 ff.

do something one does not even wish to do, namely to work. The evolution of the economy and above all of the money economy can from this point of view be described as a proliferation of surplus and scarcity.

For scarcity in society is a *social* problem. Although we experience it in the material dimension as a limitation of the quantity of available goods, we would certainly be able to reach some basis for understanding – if it were not for the possibility of unequal distribution and were it not rational (as theories of property have maintained since antiquity) to enhance inequality because this provides better opportunities to discover and exploit the economic potential of a society. Much more so than in the case of the law, time binding in the case of scarcity is at the cost of social tensions; it is a binding of time that serves to construct a complex, efficient social order rational in its own terms.

The institution that has been developed in relation to scarcity problems is called *property*. In the first place we think of this as a legal term, moreover a very narrow one in the civil law tradition, set off against mere possession, usufructuary rights, claims, etc., and then expanded within these limits as a concept of competence. In our thinking this obscures the fundamental difference between normative and scarcity-related time binding. Since the late Middle Ages, the right of disposal (*dispositio*) and no longer simply the right to exclude others from the use and enjoyment of things has become the nucleus of the property concept. The scarcity paradox is more or less built into the property concept, so that the principal significance of property becomes the ability to acquire, alienate, and transfer it. The institution thus adapts to the money economy, and a specifically economic rationality arises, relating to the form having/not-having property in money or goods and controlling itself constantly in terms of this disjunction. Restructuring the law was indispensable for this development, but the outcome is not juridical rationality in the considered handling of legal constructions, but economic rationality in the sense of an immense improvement in providing for the future within the context of the paradox of surplus and scarcity.

Early modern society in particular has understood itself to be a legal institution in two different aspects – *dominium* and *imperium*, thus preparing the nineteenth century theory of the separation of soci-

ety and state.[21] Placed in the universal context, this gave expression to an unusually high degree of density in legal regulation in respect of economic and political matters. It is to be assumed that the family (and not the law) normally guarantees property. This applies to a particularly impressive degree in China. But in antiquity, too, a sharp distinction was drawn between *oïkos* and *pólis* without condensing this distinction into a legal norm. Without being able to go into any dépth in these questions, we will establish the different nature of these two forms of time binding, specifically in relation to the differences in consequent social problems. For it does make a difference whether one feels predetermined by norms set by others and dreams the dream of legitimation by participation, or whether one is hungry now while others speculate daily with billions.

Sociologists still tend to refer to the outcome of this social development by names that European eighteenth and nineteenth century society gave itself – whether 'bourgeois' society or 'capitalist' society. The one takes an obsolete model of stratified society as the measure of things, and the other over emphasizes a single element, namely the necessity of capital formation. Theoretically these concepts – as historical concepts – are not very helpful. In our context, however, our sole concern is adequately to understand the evolutionary achievements constituting the structural determinants of modern society that are relevant for our purpose, namely the tremendous expansion of the potential for regulation by nationalizing the law, and the similarly immense expansion of economic possibilities by the monetization of property. In both cases a technically superior secondary coding is deployed. Political power (with the code government/the governed, and on the government side later also: government/opposition) is reformulated as the rule of law (*Rechtsstaat*) with the result that law becomes a technical instrument for the implementation of political will, but also serves to bind this will. And, vice versa, every individual can now avail himself of state power for the purpose of asserting his rights, *provided he is in the right*. In a parallel development property

21 On the rationality of property as a social legitimation myth see for the seventeenth and eighteenth centuries Niklas Luhmann, 'Am Anfang war kein Unrecht.' In Niklas Luhmann, *Gesellschaftsstruktur und Semantik* Vol. 3 (Frankfurt, 1989), pp. 11-64.

becomes monetized, so that what counts is no longer the code have/have-not, but whether – within the context of the economy – one decides to pay a certain price or not. This secondary coding converts all property into liquid form, above all making it possible to consume or invest both on the basis of property one already has and on that of credit. The willingness, in particular of the wealthy (wealthy people, wealthy countries), to incur debts increases immensely, opening up economic possibilities in the domain of rational calculation that had hitherto been inaccessible.[22]

This expansion in the possibilities of regulation and financing without the consequent problems becoming directly visible tempts us nowadays to relate risk policy, too, to the use of legal and financial means. That is to say, to use the law to control or prevent overly risky conduct; or to spend money on less risky but perhaps more expensive technologies, on corresponding research, on insurance and on compensation. Precisely because of the efficiency of these means, this may indeed happen to a considerable extent. It is our contention, however, that in the case of risk we are dealing with time binding forms of a quite different sort, and that for this reason we ought first to become familiar with the novelty of the problem.

IV.

The ethical utilitarianism of the eighteenth century had, with the aid of certain assumptions on options for action, freed itself from both religion and from the psychological complications of the *sciences de moeurs* of the seventeenth century. The most important assumption was that there was a broad range of options for action beneficial to oneself without harming others. Within this scope one could act with moral impunity. The scope could be extended with the help of the institution of freedom of contract; for any loss to a consenting party

22 Since we have spoken more than once of rational calculation, we should remark that this does not imply that no errors occur. On the contrary! But insensitivity in relation to error can also increase, especially in very large organizations and not least of all in the organizations referred to as the 'state'.

did not count. The contract was deemed to be the mechanism for compensating possible disadvantages (for example, by financial consideration) and at the same time as a form of consensus-maximization in areas of activity where the advantages and disadvantages of actions were distributed in a socially unequal manner. This overall arrangement naturally presupposed future advantages and disadvantages, complemented by the usually juridical techniques of dealing with errors (challenging the contract, withdrawal, impossibility of performance, frustration of contract, interpretation of the will of the contracting parties, etc.). There were thus forms taking into account the circumstance that the future could turn out to be different from what one had expected. But these supplementary institutions, like exceptions, proved the rule that there exists a broad range of options for action within which – as we would express it nowadays – one could act to the Pareto optimum. All safeguards to liberty written into modern constitutional law are based on the same premises. The centre of gravity of rationality in society thus shifted to individual action and to contractual cooperation. It was no longer presumed to be part of human nature. And revolutionizing or reforming the old societal order was intended precisely to adapt social institutions to this principle instead of justifying them as had hitherto been done as articulations of human nature, and thus as being invariant.

Could, however, this premise, covered by the terms 'liberal, liberalism', be untenable? Could it be that there are no circumstances in which someone may act to his own advantage without harming others?

There is a similar debate going on – with a significant shift from moral theory (ethics) to politics – under the heading of 'paternalism'.[23] The question posed is whether it is the task of politics to protect the individual against himself where no-one else is affected. For does this not mean treating him as if he were underage?[24] Since everyone nowadays is insured and furthermore has a right to help in emer-

23 See Rolf Sartorius, ed., *Paternalism* (Minneapolis, 1983); Donald Van Die Veer, *Paternalistic Intervention: The Moral Bounds of Benevolence* (Princeton, 1986).

24 It is not by chance that wherever paternalistic policies are favoured, the opinion frequently prevails that people still need to be emancipated.

gencies, the case of pure self-harm no longer appears to exist. Moreover, sociology at least has little difficulty in discovering social causes wherever an action is judged to be problematic, pathological, or unreasonable, or simply gets on other people's nerves.

We recall that actions and sequences of actions are a problem of attribution and are made perceptible by attribution. But what happens if the development of social structures leads to habits and sensibilities in attribution changing? If decisions appear within observation range of society where hitherto there had been none? If things one had taken for granted disappear and have to be replaced by decisions?

Until very recently, discussion of the problem mentioned above had been conducted on a different basis. The principal question had been the feasibility of engendering social conditions, of being able to plan for society and of the limits of this possibility.[25] In the three centuries of experience with modern society, faith in such feasibility has paradoxically both grown (especially due to technological developments) and waned (above all in the wake of political developments). It is nevertheless still so strong that entire sciences – especially economics – live by prognostication, which, because of its inaccuracy, has to be corrected by further prognostication, which because it is not accurate.... Political science, too, cannot resist espousing a conception of politics as goal-orientated action, although it sees the real problems as being located more and more in the unintended and unanticipated side-effects of action.[26]

We can characterize this way of looking at things as observation of the first order, thus conceding it the right to its own objectivity. It can be regarded in this light. But in the perspective of second-order observation, production, planning, and action appear as the artefact of an attribution, as the outcome of being observed. This way of looking at

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25 In the sociological literature on technological and other risks, too, we find this preoccupation with feasibility, for example, in Adalbert Evers and Helga Nowotny, *Über den Umgang mit Unsicherheit: Die Entdeckung der Gestaltbarkeit von Gesellschaft* (Frankfurt, 1987).

26 For critical discussion see Niklas Luhmann, 'Politische Steuerung: Ein Diskussionsbeitrag.' *Politische Vierteljahresschrift* 30 (1989), pp. 4-9 and the reply by Fritz Scharpf.

things allows us to include problems that would not be possible in the perspective of first-order observation.

The actors believe they are able to accept responsibility for their intentions and to keep the consequences of their actions under control. So they lay down norms, they intervene in the distribution of scarce commodities. Then comes a series of explanations for failure: errors, complexity, intervention by third parties, or hindrance already at the planning stage of what had really been intended. Once again, this might be acceptable to the first-order observer (that is to the actor himself). An uncomfortable world offers no end of comfortable explanations. At the second-order level one also sees everything that follows from the fact that an action is observed as *a decision made by others*. This may lead to dissent and subsequently to politics. We are aware of this.

For our topic another aspect is of greater importance. *The observer of a decision maker may assess the risk of the decision differently form the decision maker himself; not least of all because he himself is not located in the decision taking situation, is not exposed to the same pressure to decide, does not have to react as rapidly, and, above all, does not share in the advantages of the decision to the same degree as the decision maker himself.*

The observer of the first order sees what he see. The observer of the second order sees *how* the first-order observer sees what he sees. The actor sees the situation with all the opportunities, occasions and conditions for acting the way he does. The observer of the second order sees relations between the personal characteristics of the actor and the way in which he apprehends the situation: hectically, anxiously, neurotically, with foolhardiness, with an eye to promoting his own image, or trapped in a network of social pressures, scruples, and interests. Sociopsychological research into attribution had initially strongly emphasized this actor/observer difference[27]. But it later had to modify this position as research progressed, since a very large number of other variables make their contribution, and it is highly problematic to

27 See the much-quoted influential paper by Edward E. Jones and Richard E. Nisbett, 'The Actor and the Observer: Divergent Perceptions of the Causes of Behaviour.' In Edward E. Jones et al., *Attribution: Perceiving the Causes of Behaviour* (Morristown, N.J., 1971), pp. 79-94.

establish general sociopsychological regularities on the basis of an extremely wide range of situation types. At all events, what remains is the insight into the divergence of the perspectives that one uses in different cases in the present (and that always means simultaneously and thus incommunicably) to face up to an uncertain, not yet established future. The effects of this discrepancy in perspective will be all the stronger the more we see the future as depending on the making of decisions and the more we thus see decision making as a risky procedure. We assume that this discrepancy reproduces itself in a manner that can never be overtaken by communication, because the participants in the communication process are always both acting and observing simultaneously – saying something in the presence of an observer or remaining silent where they could have said something, while at the same time producing information that only to a minimal extent can in its turn become the object of communication. In solidly structured social orders evidencing little variation in the relationship between past and future, this problem has little effect. Norms and rules of morality on scarcity providing direct guidance suffice.[28] There is little occasion to observe others to discover theirs motives.[29] We might almost say one needs no motives at all; purposes are enough. It is only seventeenth century literature and somewhat later the novel that paints a markedly different picture. And then the selection of purposes and the loss of their natural appropriateness become a problem.

These reflections lead us to contend that the time binding forms of risk react to a novel situation in which the tension between the temporal and the social dimensions spawns new problems. This does not of course mean that norms and the regulation of scarcity lose their importance. It is simply that they are joined by another problem form that

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28 See George M. Foster, 'Peasant Society and the Image of Limited Good.' *American Anthropologist* 67 (1965), pp. 293-315; George M. Foster, *Tzintzuntzan: Mexican Peasants in a Changing World* (Boston, 1967).

29 The institutionalisation of *confession*, seen in this context, is an important and far-reaching exception. See Alois Hahn, 'Zur Soziologie der Beichte und anderer Formen institutionalisierter Bekenntnisse: Selbstthematisierung und Zivilisationsprozeß.' *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 34 (1982), pp. 408-434.

can no longer be fully integrated into the refined problem solutions provided by the law and the economy. From a superficial point of view this finds expression in an (often exaggerated) critical attitude towards the law, property, and money, and also towards the rationality of inequality, as if all this would have to be abolished by revolution or in some other way. It is more realistic to mistrust this expectation, while clearly recognizing the limits to the performance of the traditional forms and paying attention to the novelty of modern society's perspectives on the future and its forms of time binding.

It had always been possible to justify norms and scarcity regulation, however controversial the corresponding theoretical offerings turned out to be. The requirements of societal order provided a final, meaning-constitutive perspective, even after religious interpretation had lost its dominant position. Theories attempting to justify normative bounds and the regulation of scarcity were able to call to witness the perceptible advantages of the corresponding conventions.[30] Risk as a future form appears to indicate a quite different relation to reality, and for this reason, too, it can be accommodated neither in normative structures nor in systems of distribution. Risk reflects no requirement for order but a fatality. It is not by chance that this relates to a more pronounced perception of ecological problems, that is to say to the question of the extent to which society can establish itself in its environment by means of its own operations. There is no final authority – be it even an 'invisible' one – on which one can off-load the uncertainty called risk. What remains are only differences, distinctions, forms permitting us to articulate it. And it might well be the case that in the course of a semantic development already becoming apparent,

30 Perhaps the most remarkable elaboration of this thought, calling upon neither religious content nor social contract, indeed not even consent, but only easily understandable advantage, is to be found in David Hume, *A Treatise on Human Nature*, Book III, Part II, Section II, op. cit., Vol. 2, p. 190 ff. The rule in question is: 'abstinence from the possession of others' (p. 196), that is to say regulation of scarcity and for Hume at the same time the basis for all normative regulation. However, an easily understandable advantage presupposes that the solution to the problem of social coordination is already in sight or even is already being practised by society. But precisely this cannot be presupposed in the case of risk acceptance.

this syndrome of difference/contingency/uncertainty will also undermine and dissolve the still current normative and utilitarian-economic justificatory arguments.

V.

In comparative analysis, problems tend to be formulated more abstractly. When we examine the ways in which time is bound at the cost of society, of disadvantages and inequalities, we can compare the formation of structures in social systems from both a historical and a material point of view. In addition to the familiar historical forms of time binding structure formation, a new one has appeared on the scene that does not fit in with the others, and which for this reason – perhaps only for this reason – finds its rationality questioned. It is the taking of risks.

By taking risks we gain opportunities we would otherwise forego. This is not a particularly exciting observation. It appears to leave it up to the actor to decide whether he is going to take the plunge or not. The problem becomes important for social theory only when structures assume this function and encourage, force, and normalize the taking of risks, or even absorb the risks invisibly present in numerous individual decisions.

Under the euphemistic aegis of equality and liberty such structural developments have been covered and encouraged without considering how little the traditional instruments of rationality lend themselves to dealing with the ensuing problems. Equality means justifying the generation of inequality and regarding it as being a decision or open to prevention by decision. Liberty means that precisely this is deemed to be the precondition for individuals and society getting along with one another in an acceptable manner. The liberal ideology even contains a hidden programme for adjusting society to risks. It was only the spectacular upsurge of ecological risk in technological development that finally impelled an awareness of the high degree to which society itself is affected by what it has triggered off, indeed forced through.

Risk is a quite specific form of dealing with the future in that it has to be decided on in the medium of probability/improbability. The determination of legal norms or the acquisition of scarce goods secures

something specific for the future and perhaps exposes itself to danger in implementation. With the form of risk, by contrast, one exploits precisely the indefiniteness of the future, indeed one's own lack of knowledge so to speak, for the purpose of couching the present in forms that can be confirmed or also refuted by future presents. The future, which can become the present only in one guise or another, but at any rate only in one specific guise, is given a fictitious form that as such will never occur – namely the form probable/improbable. It is only this move that creates the leeway for present commitments and at the same time the leeway for social agreement or disagreement on such commitments. One expects oneself and others to consent in the determination of probabilities/improbabilities. And commitments in respect of an unknown future – an additional argument – cannot be made in any other way. One can only make a risky decision – or sit back and wait. And the form of risk means that waiting, too, is a risky decision.

In summarizing these brief considerations, we contend that 'risk' is thus to be understood as a form serving the purpose of form formation in the medium of probability/improbability. The medium itself is a two-sided form facilitating the crossing from one side to the other. One may be more exigent or less so in determining sufficiency criteria for probability/improbability; what satisfies one person may fail to satisfy another. Like the overall concept of probability, every measurement is fictitious and thus nonbinding – at any rate when it is a matter of statements about the future. For this very reason it is relatively easy to fix forms in this medium, since we know very well that no one already lives in the future, and that no one can therefore know any better. However, this facility does not at all mean that it is easy to achieve consensus or to agree on the acceptability of a risk. For the ease with which forms can be coupled in the medium of probability is beneficial both for the person who wishes to communicate his dissent and the person who seeks to achieve consensus. It can only be stated that this overall constellation lends the social dimension greater weight or at any rate assigns it another status than in the case of norms or of scarcities. It is a matter neither of legitimation nor of distribution – and we should thus avoid this vocabulary when establishing the specificity of time binding in the form of risk.

Chapter 4
The Risk of Observing and the Coding of Function Systems

I.

What lies in the future cannot be observed. This induced Aristotle to ask how judgements about the future could possibly be made using terms such as truth and falsity. The answer is of course that the judgement must be left undecided. Although the binary code true/false is universally valid, decisions on future contingents can quite simply not yet be made.[1] This has on occasion been interpreted as necessitating a third logical value, that of undecidability.[2] One could also assert that it is necessary to draw a distinction between the present future (when the prognosis is made) and the future present (the point in time when the event occurs). This was, however, traditionally regarded simply as a defect in human cognition. Moreover, the problem was not so urgent because the *contingentia* were only *singularia* (for example, a sea battle) and were not concerned with the species and genera of things, nor with the cosmos of essences.

In more modern times the problem has not primarily presented itself as profoundly disquieting. Where cognition is inadequate, one relies on will and competence. The inability to decide is balanced by a regulable progression. Hobbes still adheres to the old pattern: everything in the future is to be judged as either true or false. Where we cannot decide in these terms, we refer to the decision as contingent.

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1 As in *De interpretatione 9* and the subsequent, above all medieval literature *de futuris contingentibus*.

2 Thus especially promoted by the Polish school of logic, namely by Lukasiewicz. See also Arthur N. Prior, 'Three Valued Logic and Future Contingents.' *Philosophical Quarterly* 3 (1953), pp. 317-326; Gotthard Günther, ed., 'Die Theorie der 'mehrwertigen' Logik.' In Gotthard Günther, *Beiträge zur Grundlegung einer operationsfähigen Dialektik*, Vol. 2 (Hamburg, 1979), pp. 181-202.

And then it is a matter of power and of the capacity for action.[3] However, what is to be done if the problem is contained precisely in the proposed solution? Precisely in the fact that a decision has to be made?[4] For it could be that the future is indeterminable not only because what will happen depends on too many known and unknown factors, but above all because it is back-coupled with the process of deciding itself, thus depending on what decisions are made in the present.[5]

In view of the inadequacy of the action (or freedom) theory solution, we will have recourse to a concept of observation, superordinate to cognition and action, which indicates nothing more than the use of a distinction to indicate the one side to the exclusion of the other.[6] Every distinction has two sides, no more and no less. Already at this still very formal level twin risks become apparent. The first is in the choice of a distinction, that is to say of an already specified two-sided form to the exclusion of other distinctions. One asks, for example, whether a sea battle and not whether a crop failure will occur. The second risk is in indicating the one (and not the other) side of the distinction. The two risks interlock (and Spencer Brown takes their indivisibility as the basis for using the marking of the name within a distinction as the sole operator of his calculus). For everything depends on the sort of distinction: *sea* battle and not *land* battle; sea *battle* and not sea *trade*. It would be fatal to prepare for a land battle instead of a sea battle (the error committed by the Persians!), but natur-

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3 The corresponding passages are contained in Chapter X ('Of power and act') in *De corpore*, quoted after Thomas Hobbes, *Opera Philosophica quae latine scripsit* (ed. Molesworth), (reprint Aalen, 1961), p. 115 ff.

4 On the lack of an adequate theory of freedom of decision in Aristotle see also Charles Larmore, 'Logik und Zeit bei Aristoteles.' In Enno Rudolph, ed., *Zeit, Bewegung, Handlung: Studien zur Zeitabhandlung des Aristoteles* (Stuttgart, 1988), pp. 97-108. But does the assumption of freedom of decision offer a solution? Is this not rather the problem?

5 The divinatory systems had attempted to exclude this element of decision dependence with tales such as the Oedipus myth, which show that the prophesied fate is brought about precisely by the decision taken in the attempt to avert it.

6 The concept has already been introduced in Chapter 1 in connection with George Spencer Brown's *Laws of Form*.

ally also to proceed on the assumption that it was a matter of maritime trade. What can an observer do to avoid the sort of risk that lies in the selection of one side of a distinction to the exclusion of the other – which prevents him from indicating what matters? How do socialists avoid the risk of being guided by the distinction drawn between capital and labour, despite the fact that this distinction has possibly long since ceased to be relevant?[7]

We could feel that the solution lies in drawing distinctions between distinctions, but in so doing we simply repeat the problem at the level of second-order observation. For drawing and indicating distinctions between distinctions is also an operation of distinguishing and indicating – is observation. Hence the risk lies in the structure of the operation we call observation. To be more exact, it lies in the indispensable unity of drawing and indicating distinctions, in the fact that all indications have to be deployed in the context of distinctions and that all distinctions have to be selected in relation to indications. We therefore always find ourselves on only one side of the form, the latter being nothing other than the possibility of crossing its boundaries. Land battle or sea battle – that is the question. Or to be or not to be. Depending on how we distinguish what we are distinguishing. But the transition from asking what to asking why. does not solve our problem. It only consolidates it autologically by self-reference. To define the distinction of a distinction is also to define a distinction.

We must therefore generally proceed on the assumption of a risk of observation. It lies in the dependence of this operation on a distinction, requiring the operation to take as its starting point one side and not the other, although the other also exists. Initially the risk may appear small, since the distinction does after all allow the boundary marking it to be crossed. But to do this we need a further operation. We need time! and how are we to decide between staying where we are and crossing over to the other side?

We could also say that observation has to use the pertinent underlying distinction *blindly*. It then becomes problematic to speak of risk, for in our definition the concept presupposes a decision. But as soon

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7 See Niklas Luhmann, 'Kapital und Arbeit: Probleme einer Unterscheidung.' In Niklas Luhmann, ed., *Die Wirtschaft der Gesellschaft* (Frankfurt, 1988), pp. 151-176.

as a system is capable of second-order observation – and this can at all events be imputed to modern society and to its function systems – it becomes evident that we cannot see what we cannot see; that we are at the mercy of the distinction we are using in each particular instance for the purpose of observation (because observation without drawing distinctions is impossible). We can escape its clutches only by rejecting or accepting another distinction, to which the same applies. And on this level of autological observation of observation the definition of distinctions becomes a risk – and indeed a risk no observer can avoid.

II.

The solution to this problem is not trying to cope somehow or other, getting it right in spite of everything, or somehow obtaining security or ensuring safety. This would require supernatural help, and we would then have to know where and how to go about getting it. The solution appears to lie in the opposite direction. It is based on the acceptance and elaboration of the problem, on a multiplication and specification of the risks. In other words, we have to collaborate with distinctions, not combat them. The relevant model can be found in the binary codes of modern function systems, especially in cases where they are highly technological, where they function almost like logically symmetrical exchange relations, hence offering a practically safe option on the present. What is not true is – with the certainty science can provide – false.

In binary coding, modern society possesses a highly specific form for heightening, normalizing and contextualizing risky behaviour. By attributing observations to certain coded systems, we can recognize which risk network we are operating within – and which one we are not operating within. Whenever a matter is dealt with in the context of a binary code, the implication is that not only the positive value but also the countervalue could be assigned validity. A business deal can be profitable, but it can also create a loss; a piece of research can produce results that are true or false, that either enhance reputations or are unhelpful in this respect. A binary code virtualizes its scope of application in relation to *both* possibilities. From the standpoint of the

code alone, one would have to assume an equal distribution of chances, since there are no third values, which, capable of associating with one or other of the two sides, could shift the weighting. However, as soon as a code is institutionalized and operations start being attributed to it, this equality of distribution becomes disturbed. An imbalance arises. The systems thus formed tend to take up options that primarily favour the positive value. Money is then invested only in predictably lucrative projects. Experience gathered in the process is then held in reserve for future use in the form of programmes determining the correct attribution of the values of the code. The system begins to learn – indeed, with the help of what has already been learned, it begins to learn more efficiently. However, all efforts of this type continue to depend on the code. Being the precondition for experience in application, such efforts presuppose a coded system. They cannot be transferred from one system to another any more than can the programmes themselves.

Breaches in symmetry permit the emergence of irreversibilities. This simply means that they lead to further breaches in symmetry between past and future.[8] It is only on this condition that the future can differ from the past, and only thus are risks conceivable. With the progressive differentiation of society and the coding of language, this regularity permits the development of a societal history determined by whether language is used to accept or reject the meanings proposed. If within the societal system binary coded function systems are further differentiated, this process repeats itself in frequently divergent and accelerated form. The option for the positive value of the code, for legality, truth, property, for institutionalized power positions, engenders a capacity for connectability and thus for history. The option for the respective countervalue reflects the pertinent conditions, engenders contingency, and thus keeps the future open. The system thus exposes itself fundamentally and continuously to the risk that it can

8 Thus the well-known central thesis of Ilya Prirogine, Vom Sein um Werden: *Zeit und Komplexität in den Naturwissenschaften*, (German translation Munich, 1979). See also Ilya Prirogine, 'Order out of Chaos.' In Paisley Livingston, ed., *Disorder and Order: Proceedings of the Stanford International Symposium* (Sept. 14-16 1981), (Saratoga, Cal., 1984), pp. 41-60.

operate only with the preferential value, but can do so only under conditions that require the countervalue to be always able to impose itself. There is then no longer any guarantee that what is past will be preserved and that the future will be like the past – despite irreversibility!

A further characteristic of coded systems is that they never come to an end. They are fundamentally ateleological. For every individual operation produced in the recursive network of its autopoiesis, the option for either the positive or the negative value remains open, and this decision can be made only with an eye to subsequent future operations. They are systems in which every end is simultaneously a beginning – they are nontrivial (historical) machines in Heinz von Foerster's sense of the term.[9] However, this means that there are no established time horizons for risk evaluation. The future of closed systems is an open one, and the risks they have to deal with are basically incalculable.

Codes are abstract and universally applicable distinctions. Although formulated in terms of a distinction between a positive and a negative value, they contain no indication of which attribution is correct, the positive value or the negative one. Truth, for example, is no criterion for truth, and property is no criterion in the question of whether it is worthwhile acquiring or retaining it. It is only under the condition of openness towards both the positive and the negative option that a social system can identify with a code. If this occurs, it means that the system recognizes as its own all operations that are guided by its own code – and rejects all others. The system and the code are then firmly coupled. The code is the form with which the system distinguishes itself from the environment and organizes its own operative closure.

On the other hand, this openness imposes decisions – and inevitably – the taking of risks. The system cannot remain neutral in the question of which of the two values is to be selected, for this decision is instrumental in producing the connectability of its own operations.

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9 See Heinz von Foerster, 'Principles of Self-Organization – in a Socio-Managerial Context.' In Hans Ulrich and Gilbert J. B. Probst, eds., *Self-Organization and Management of Social Systems: Insights, Promises, Doubts, and Questions* (Berlin, 1984), pp. 2-24 (6).

It is only when a decision has been made on whether something is just or unjust, true or false, ill or healthy – or whether such a decision is at least possible – that the system can determine the consequences and make use of the security thus gained within the system. This is the only way it can learn, the only way it can create order, which then includes and excludes what is to continue to be possible in the system. Again, in view of an environment that cannot be controlled by the system, this will always remain a risky decision.

The progressive differentiation of binary coded function systems eliminates decision criteria external to the particular system. This also holds for recent attempts to reintroduce such criteria into the discussion under the pseudonym of 'ethics'. In a certain manner of speaking, a coded system is thus abandoned to its own devices, and this means above all that it can find no grounds for *not* applying its code – for not espousing a politically attractive topic, for not curing an illness, for not investigating the wrongs and rights of a legal question – should the system in question present itself as a coded one. Of course, society has many – and weighty – reasons for rejecting its codes; but these grounds cannot be asserted within the function systems; or where they can be, then only in an internally programmed form, for instance as the 'political questions' doctrine, which first came up in *Marbury v. Madison* (1803), a Supreme Court decision.

How does a system that imposes upon itself the rule of never letting an opportunity go by come to terms with rationality? Apparently the classical expectation of rational decision making is above all replaced by the attempt critically to improve the modalities of the operation. We have discussed a case of this type with the example of consequence-orientated legal practice.[10] If we go a step further, we seem to come to the inevitable conclusion that a preference for risk aversion displaces the preference for rational decision making.[11] The rule would then be to take as few risks as is compatible with the per-

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10 See Chapter 3 II.

11 See Dirk Baecker, 'Rationalität oder Risiko?.' In Manfred Glagow, Helmut Willke, and Helmut Wiesenthal, eds., *Gesellschaftliche Steuerungsrationalität und partikulare Handlungsstrategien* (Pfaffenweiler, 1989), pp. 31-54.

ception of opportunities, and to expect a corresponding attitude in others.

Binary coding can from all these points of view be understood as an immense heightening of the riskiness of system operations. Coded systems are emancipated systems; they take the liberty of choosing between the two values of their code without predetermination of the topics to be dealt with. By the same move, however, they are also compelled to make a decision or – where a situation has not yet been sufficiently elucidated – to postpone a decision, and in one form or other to assume a risk.

However, the form imposing such universal competence is always a very specific one. There are numerous quite discrete codes between which – due possibly to the decision making programmes – interference is kept to a minimum, indeed, treated as an 'accident' not provided for by the system. A discovery that is scientifically true need not be profitably exploitable (and there are, vice versa, lucrative technological developments based on theories later disproved[12]). A person who obtains a favourable ruling in court may nonetheless be ill. Good examination results are still no guarantee for a career. In crossing the system boundaries a topic also changes code and is thus subject to reevaluation. Such a system – and our modern society is one – can function only if normal communication is in a position to distinguish between individual codes and thus between individual function systems. In the combination of universalism and specificity[13] lies a typical structural characteristic of modern society, imposed by functional differentiation and that, although unable effectively to prevent particularisms (for example, ethnic, nationalist, or denominational), is able to present them as problematic.[14]

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12 On such cases and on the dependence of many technological developments on the sciences, see Mario Bunge, 'Technology and Applied Science.' *Technology and Culture* 7 (1966), pp. 329-347 (334).

13 Formulated with reference to the Talcott Parsons' theory of 'pattern variables'. For a concluding complete outline of the theory see Talcott Parsons, 'Pattern Variables Revisited.' *American Sociological Review* 25 (1960), pp. 467-483, reprinted in Talcott Parsons, *Sociological Theory and Modern Society* (New York, 1967), pp. 192-219.

14 This topic cannot at this stage be paid the attention it merits. We will

These structural parameters, as far as they go, also impose a peculiar order on the burden of risk borne by modern society. On the one hand, binary coding increases the riskiness of all operations; for the other value could always be considered, and in retrospect could always have been considered. On the other hand this principle limits riskiness – at least as far as the decision making situation is concerned – to the two values of the respective code. The famous postulate of falsifiability (Popper) states that truth theses are scientifically relevant only if we take the risk that they could be false. Nothing else is tolerated any more. Science forces itself to proceed at risk. However, it does so with the proviso that it decides itself what is true and what is false.

Despite this closure, transfer effects are perfectly possible. It can be politically fatal if the government loses an important legal case. Whether this will influence the outcome of the next election is not a legal matter, but is subject to political evaluation within the political system. Society thus forgoes traditional multiple safety-nets, multifunctional institutions such as the family responsible for all aspects of the individual life, with its network of membership or its morality encompassing all relationships. (Morality, too, becomes a special code with heightened and limited risks.) This renunciation in its turn actuates unforeseeable risks, which can result from the fact that risks acceptable in one system may have unpredictable effects on other systems – consider, for example, the consequences of scientific progress in the fields of microphysics and biochemistry on the economy and politics.

In other words, society encourages the assumption of risk within the function systems by means of universalization and specification. At the same time it reduces security devices, formerly located above all in the family and thus in stratification structures, and abandons the consequences to an evolution not subject to centralized control. It will work out or not – depending on whether the individual function sys-

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merely remark that the indigenous weight, emotional ties, and lack of alternatives of this tribal nationalism with or without the addition of religious orientation could be related to, indeed provoked by, the facility with which the function systems in their worldwide operation can assume risks.

tems are capable of tolerating and absorbing by their own means the willingness of other function systems to take risks. And it is not least of all this situation that provides one of the reasons why the future is opaque to us and why we see it in terms of potential and possibly no longer controllable losses.

Chapter 5
The Special Case of High Technology

I.

The fact that the subject of risk attracts so much attention nowadays – that even society itself is described as a society of risk – is attributable chiefly to rapid technological developments in fields under the scientific aegis of physics, chemistry, and biology. More than any other single factor, the immense expansion of technological possibilities has contributed to drawing public attention to the risks involved. Inversely, the rejection of new technologies, which used to find manifold justification, involving religion and morality, ideology, or vested power interests, is now primarily based on the risks that have to be assumed when new technologies are introduced.[1]

A somewhat superficial explanation could be that as far as both potential advantages and potential losses are concerned, new quantitative dimensions have been attained. The relation between advantage and potential loss also seems to have shifted for the worse, if we compare the benefits of the steam engine with the risk of occasional boiler explosions – however, much this topic might have obsessed the nineteenth century. Apparently what we now refer to as 'high technology'[2] engenders real changes. The dramatization of opposition be-

1 This does not, however, mean that quantitative research into risk perception and risk acceptance makes it possible adequately to predict the social acceptance of new technologies. See Harry J. Otway and Detlef von Winterfeldt, 'Beyond Acceptable Risk: On the Social Acceptability of Technologies.' *Policy Sciences* 14 (1982), pp. 247-256.

2 We use the expression 'high technology' and not 'large technology' to distinguish our subject matter from analyses, which, taking for example telephone networks or transport networks, seek to emphasize the network structure; for this is of little interest for the topic of risk. See especially Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore, 1983); Renate Mayntz and Thomas F.

tween decision makers and those affected that this has actuated has, however, done little to clarify the situation. Is it a question of only quantitative shifts? If this were the case, then alone the preferential perception of certain quantities as opposed to others (such as the number of casualties in traffic accidents) would require psychological if not sociological explanation. And we would above all have to examine whether, in view of developments in the technological implementation of scientific knowledge, we can sustain the concept of technology that has hitherto served and still serves to register the pertinent phenomena.

We shall start with this question; for the concept of technology determines what we observe and what we do not observe; and it also controls which causes and effects are attributed to one another and which not. And, as we have done with the concept of risk, we emphasize the form, i.e., the distinction that marks the concept of technology on the one side (and thus not on the other).

It is an old tradition to understand technology in terms of it being distinct from nature. Nature is what emerges and passes of its own accord (*physis*). Technology is the making of an object or a state deviating from what nature would have brought forth itself. In contrast to nature, the technically produced work is conceived as being ontologically neutral. Nature might fail to achieve its state of perfection if its normal course is disturbed. But the technical product can exist – or not. For the initial phases of European thinking this difference represented a religious problem; for what could be attributed to human ability could not very well be due to the cosmos itself (due in the sense of *aitáa*).[3] By including humankind in the Creation, Christianity was able to mitigate this distinction. It nevertheless remained the basis for the understanding of technology up the modern period. In

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Hughes, eds., *The Development of Large Technical Systems* (Frankfurt, 1988); Peter Weingart, "Großtechnische Systeme" – ein Paradigma der Verknüpfung von Technikentwicklung und sozialem Wandel?' in Peter Weingart, ed., *Technik als sozialer Prozeß* (Frankfurt, 1989), pp. 174-196.

3 Cf. Margherita Isnardi Parente, *Techne: Monumenti del pensiero greco da Platone a Epicuro* (Florence, 1966); Jörg Kube, *TEXNH und ARETH: Sophistisches und Platonisches Tugendwissen* (Berlin, 1969).

the transitional period between the late Middle Ages and the early modern era a radical shift in interest occurs from 'What' questions to 'How' questions.[4] The fair world is no longer only an object of religious admiration and a problem of practical coping; the central question is now how is it to be brought about. The break with Greek-Hellenistic-Roman technical awareness is very difficult to localize with any precision (one need only consider rhetoric) – but on the whole the printing press, itself a technology, is the principal factor contributing to a novel radicalness in asking 'How?' On this basis the aim of the early Renaissance to resuscitate Graeco-Roman techniques can then be substituted by the aim of making new knowledge and novel products possible. To be able nevertheless to operate with assurance, technology is initially apprehended as a copy of natural causal relations (Bacon) or, with John Locke and others, as a parallel action to the creation of the archetypes by God. This put paid to the religious problems.[5] Since, however, it was still a matter of technology versus nature, nature was aesthetically and sentimentally upgraded so as to be able to be on equal terms with the antagonist. Thinking itself can then be understood as analogous to a technical process, for instance, in Novalis as 'Freyes successives Isolieren außerm Raum'.[6] It was not until modern constructivist epistemology that this distinction between technology and nature (if only in these specialist confines) was fundamentally questioned.[7]

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4 See Wolfgang Krohn, 'Die Verschiedenheit der Technik und die Einheit der Techniksoziologie.' In Weingart op. cit. pp. 15-43 (esp. 24 ff.).

5 This is not to say that we agree with the contention that the Christian religion promoted the development of technology while overlooking its effects on nature. As a religion it at any rate waived the possibility of declaring technology as such to be a provocation of the gods, as hubris etc. Its comprehension of nature as being distinct no longer from technology but from grace was alone sufficient to free technology from constraint.

6 'A free successive isolation outside space'. Original quoted form the collection 'Philosophische Studien 1795/96' in the edition by Hans-Joachim Mähl and Richard Samuel, *Werke, Tagebücher und Briefe Friedrich von Hardenbergs* (Darmstadt, 1978), Vol. 2, p. 12.

7 See Jean-Louis Le Moigne, 'Quelle épistémologie pour une science des systèmes naturels "qui sont avec cela artificiels"?' *Revue internationale*

The consequences of the form provided by tradition are still evident today. Although the concern with technology now regarded as 'classical', be it on the part of the humanities or the social sciences, has – since it is grounded in concepts such as spirit or action – abandoned the older confrontation between technology and nature, the distinctions substituted have been unhelpful theoretically in understanding and integrating the phenomenon of technology.[8] The more recent disquiet caused by risky technologies has thus been able to occupy almost virgin theoretical territory. Those who enter the lists against the risk of technology see themselves as defenders of nature (ignoring its icy temperatures, radioactivity, wilderness, and infertility). The consequence is a conceptually controlled stiffening of resolve on both sides. The distinction becomes a controversy. The defenders of nature feel called upon to defend themselves against the attacks of technology. Their manifesto can already be recognized in the brutality with which Cézanne's railway cutting wounds the landscape. It thus seems as if intervening in nature is more risky than omitting such intervention – given the present state of technological development a prejudice that one can scarcely continue to encourage[9]; and that the planting and harvesting of potatoes, especially in organic farming, is more 'natural' than production with the aid of genetically altered organisms. It may well be that the one procedure is a great deal less risky than the other; but this cannot be justified by reference to nature. For after all nature would in the course of evolution have been able to produce many genetically differing organisms, but it would scarcely have managed to produce large numbers of potatoes growing in serried rows all in one field. We must thus uncouple the discussion of technological

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de systèmique 3 (1989), pp. 251-271, with reference to Herbert A. Simon, *Sciences of the Artificial* (Cambridge, Mass., 1969).

8 A survey is provided in Bernhard Joerges, 'Soziologie und Maschinerie: Vorschläge zu einer "realistischen" Techniksoziologie.' In Weingart, op. cit., (1989), pp. 44-89.

9 See the criticism by Karl-Heinz Ladeur, 'Rechtliche Steuerung der Freisetzung von gentechnologisch manipulierten Organismen: Ein Exempel für die Entscheidung unter Ungewissheitsbedingungen.' *Natur und Recht* 9 (1987), pp. 60-67 (64 f.).

risks from the technology/nature distinction, and this means we must seek another form of technology concept.

This leads us to the not so far-fetched notion that the inside of the form, what is called technology, is a *functioning simplification in the medium of causality.*[10] We could also say that within the simplified area *strict* (functioning under normal circumstances, recurrent) *couplings* are established. This is, however, possible only if interference by external factors is to a large extent excluded.[11] Technology can therefore also be understood as the extensive *causal closure* of an operational area.[12] The result of technicalization is thus the more or

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10 Other media could easily be included, thus expanding the notion of technology. (On comparisons of this type within the framework of a general concept of 'action formalization' see also Joerges op. cit., 1989, p. 65 ff.). We need only consider the technique of economic calculation, which presupposes that all factors entering into the calculation are shown in money terms and are determined via (market-dependent) prices. This and comparable procedures presuppose the binary coding dealt with in the previous chapter, which facilitates the alternate concentration on two values by excluding any third values and by, in this sense, 'technicalizing' the operation of systems. The technique of risk analysis could also be considered in this context, with its very artificial assumptions about quantitative and monetary value equivalences. In this case the problem would then not, as is usually assumed, be whether this is morally acceptable – see Douglas MacLean, ed., *Values at Risk* (Totowa, N. J., 1986) –, but – if it is a technique – whether it functions or not. For risk analysis itself is highly unlikely to find itself in financial difficulties like an entrepreneur who calculates his profits and losses incorrectly.

11 That nature, by contrast, makes use of the advantages of loose coupling is coming to be recognized more and more and also to be proposed as an organizational principle. See for instance, Robert B. Glassman, 'Persistence and Loose Coupling in Living Systems.' *Behavioural Science* 18 (1973), pp. 83-98; Karl E. Weick, 'Educational Organizations as Loosely Coupled Systems.' *Administrative Science Quarterly* 21 (1976), pp. 1-19; Karl E. Weick, Der Prozeß des Organisierens, German translation (Frankfurt, 1985), p. 163 ff., 335 f. This, once again shows that technology cannot be understood as an imitation of nature, but rather as the very opposite.

12 See Hans Radder, 'Experiment, Technology and the Intrinsic Connection Between Knowledge and Power.' *Social Studies of Science* 16 (1986),

less successful insulation of causal relations with the consequence that (1) processes become controllable, (2) resources become amenable to planning, and (3) faults (including wear and tear) can be located and attributed. The fact that one has the option of deploying technology does not yet mean that one chooses to do so; for one thing the economic conditions for taking up the option have to be considered. But if it proves possible, one can gain the advantages of insulating specific causal processes.

This description of technology is not in itself particularly surprising and is hardly likely to be rejected. The new version can be judged only when we take into consideration the other side of the form: the immense complexity of causal processes taking their simultaneous course. This is, to use Spencer Brown's formulation, the outside of the form, the foil against which technology is delineated. The classical problem of choosing a means to an end (or an end for available means) is thus relegated to the background. The so hotly disputed 'instrumental rationality' loses a great deal of its importance. It becomes less important to concern oneself with other forms of rationality, be they descriptive (Max Weber) or committed (Jürgen Habermas). The form of technology completely loses its quality as a form of rationality; it then makes little sense to confront it with other forms of (nontechnical, noninstrumental, nonstrategic) forms of rationality. The form of rationality (the distinction determining it) would have to be discussed in another context. Technology is a (successful, more or less successful, unsuccessful) installation. Thus the increasing use of technology in modern society and the description of the world on the model of technology (in respect of content: natural laws; methodologically: *ceteris paribus* clause) does not imply a judgement on the rationality of society. And if the failure to distinguish between these two aspects has been the specifically European model of rationality, all we can do is to attest its extinction, without the need for open, domination-free discourse, *Verbalakustik* à la Heidegger or Far Eastern mysticism.

Instead, concern is focussed on what happens if the technological domain of functioning simplifications becomes enriched to an ever

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pp. 663-683, with elaboration of the similarities and differences between scientific experiments and technological realizations.

higher degree of complexity, if strict couplings proliferate and if at the same time it becomes more and more difficult to insulate the space thus defined. Effects of this sort have, or so it seemed, been hitherto absorbed by the economy. Resources had to be financed out of profits – otherwise technology was not deployed. And waste materials had to be returned to nature, if possible at a cost that could be borne. The market, i.e., the economic system itself, was in both respects the limiting factor for the deployment of technology. No other limitations were taken into consideration. However, it has been meanwhile become clear that this, too, was only a model of functioning simplification – a technical model for regulating the deployment of technology that correspondingly ignores causalities 'external' to the model. What has been realized in the shape of 'high technology' or what presents itself for potential realization in this category appears to transcend the boundaries of the technical regulation of technology – even when, and especially when, it works.

In this connection a number of problems must be identified. It can, for example, happen that the gradually compounded effects of a minimal measurement error or a minimal flaw in material – now sometimes referred to as chaos – results at some point or other in another order suddenly erupting. Other circumstances arise when newer and newer techniques are massively deployed without knowing enough about the ways in which they interfere with existing or simultaneously introduced new causalities. There can then be surprising (and in almost all cases negative) interference effects.[13] Although these may be impossible to foresee or only by unreasonably thorough testing, a learning process can take place (as when the carcinogenic effects of X-rays only became apparent in use). By introducing technology (and only by doing so), can risk thus be reduced, if not eliminated. We are faced with a different situation when dealing with rare, improbable causal combinations, from which, since they are so rare and unlikely to reoccur, we cannot learn. Someone's nose suddenly begins to bleed, his colleague's attention is distracted and he overlooks a similarly extremely rare warning light.

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13 Such circumstances are dealt with by Ian Hacking, 'Culpable Ignorance of Interference Effects.' In Douglas MacClean, ed., *Values at Risk* (Totowa, N.J., 1986), pp. 136-154.

These problems, which always have to do with inadequate causal insulation, also occur to some degree in the massive and innovative utilization of relatively simple techniques, such as in the risky field of combining different pharmaceuticals. For the domain that we call high technology it is characteristic that risks become apparent (although without indication of when and how) right from the making of the decision, and that specially developed techniques are used to prevent this potential damage. And in this case one is confronted by chaos problems, by interference problems and by those practically one-off coincidences. The problems of technology reveal themselves in the attempts to solve the problems of technology by technical means.

The form of technology thus becomes a problem. It marks the boundary between enclosed and excluded (but just as real) causalities. In high technologies this form-defining boundary is apparently constantly violated, including what was excluded, creating unforeseen cross-linkages. This problem forms the basis for the currently much discussed field of chaos research. Reducing it to its essentials we could formulate it thus: since the simultaneous cannot be controlled from within the system it is only a matter of time before it takes effect. This leads us to the paradoxical question of *whether technology*, even if it functions causally, *is technically possible at all.* For, everything being considered, if we understand technology as a functioning simplification, the astonishment at its functioning at all must be all the greater.[14]

II.

Without answering this question by a 'yes' or a 'no', we can nevertheless assemble a quantity of relevant experience gathered in commerce with high technologies. It then appears to be no accident that this experience can be summed up – although not adequately explicated – under the heading of risk.

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14 See also Henri Atlan, *A tort et à raison: Intercritique de la science et du mythe* (Paris, 1986), p. 51 ff.

A first aspect concerns the growth in causal complexity, i.e., the multiplicity and variety of causes and side-effects woven into the actually desired events. This includes not least of all 'human factors' with their notorious unreliability. What actually happens is then determined by selection processes, which accept situational conditions that become relevant in ways that can neither be built into a model nor be predicted. It then looks as if technical installations introduce strict couplings into a world, which – being highly complex and time-bound – can be reproduced only by means of loose couplings.[15] Embedded in such a context, technologies must function in an 'error-friendly' or 'resilient' manner, that is to say they have to hold their own in a contingent environment where sometimes this and sometimes that condition is given or withdrawn.

The terminology used to describe such circumstances is in many ways inadequate. For example an unexpected change in functional conditions is referred to as an incident, a malfunction, or an accident, terms that do no more than indicate the difficulty of attributing causes (or, if one prefers, terms that serve to round off the causal world view). For the technology itself, the language of regular repetition is chosen – while for the disturbance, the language of the singular event is preferred. But an adequate description would have to bring the total process down to a common denominator, that is to say, to describe technicalized processes as fundamentally contingent sequences of events as well.

It is just as deceptive to say that technical processes should not produce irreversible results. Everything that actually happens does so irreversibly. Evolution – which has led to the extinction of most of the species that once inhabited the Earth – and primitive technologies, too, have triggered irreversible changes. The problem is rather that the dosing of resources has rendered technical processes controllable. They can thus be halted when one no longer needs or no longer wants their effects. In the field of high technologies, by contrast, one needs a considerable panoply of ancillary technologies, which have to have

15 Work is being done on this concept, following Charles Perrow, by Jost Halfmann and Klaus-Peter Japp, eds., *Riskante Entscheidungen und Katastrophenpotentiale: Elemente einer soziologischen Risikoforschung* (Opladen, 1990).

two unusual qualities. If their continuous operation is to be ensured, they have to continue to function even if resources are stopped, indeed even if they are inadvertently turned off. And if they are to be deployed only in the case of abnormal incidents, switching them on must be possible, and if necessary they must then actually be switched on. We thus have on the one hand the paradoxical requirement that the installation not be switched off despite being switched off – which calls for a deeper hierarchy of control mechanisms subject to the same requirement. On the other hand we have the asymmetry of switching off and switching on with the specific character of switching on the switching off – where the simple solution of withdrawing resources fails.

The now classical example is nuclear power technology.[16] The considerable significance of this case and its safety technology lies in the potentially catastrophic effects of no longer controllable malfunctions. Another example is provided by the highly elaborated computer technology, where it is also becoming apparent that the pertinent safety technology is more difficult to install than the technology that produces the originally intended effects. In this domain, too, it is unlikely to be long before the 'mantling' or the 'containment' of the system involves higher costs that the acquisition and operation of what is so highly prone to malfunction.[17] One is almost tempted to reword Hölderlin's *Patmos*:

> Wo aber Kontrolle ist
> Wächst das Risiko auch

16 The extensive literature on this special case also provides most of the indirect contributions to the problems of high technology and the particular structure of the risks it entails. See for a recent survey Georg Krücken, *Gesellschaft/Technik/Risiko: Analytische Perspektiven und rationale Strategien unter Ungewissheit* (Bielefeld, 1990), esp. p. 46 ff.

17 See Günter Ortmann, Arnold Windeler, Albrecht Becker and Hans-Joachim Schulz, *Computer und Macht in Organisationen: Mikropolitische Analysen* (Opladen, 1990), p. 541 ff. – especially p. 547 note 15 with 20 items in small print listing the technical terms referring to what is to be taken into account in this respect.

But where there is control
Risk grows as well

Such problems cannot be dealt with by asserting that nothing on Earth is perfect, that the best of intentions can go wrong, that any planned process is apt to suffer disturbance. Technology itself now requires, so to speak, a mantle of installations, which although it requires technical simplification if the technology is to maintain its form of simplified insulation, can as such be achieved only to a limited degree. This ancillary technology, this technology to safeguard technical processes, ought also to conform to the model of functioning simplification, but it is no longer possible adequately to provide it mechanically. It requires technical simplification of another kind, and especially control systems that standardize human intervention and the capacity of human beings to react. The production technology that really attracts interest becomes a machine within a machine, a trivial machine within a machine that can be trivialized only to a limited degree.[18] The interference of nontrivialized processes then means, for example, that the machine can reconstruct itself in unexpected ways; that instead of delivering its output as product and waste it uses it as input; that it proceeds on the basis of its current state; that it intensifies deviant events; that it does something that really only people can do: it makes omissions. To the extent that the basic technology guarantees the repeatability of operations in accordance with plans, the risk of unforeseeable disturbances also reproduces itself as a lasting, ineliminable phenomenon accompanying production.

Besides this growth in complexity to the very limits of what can still be simplified – and even beyond such limits, it is characteristic of high technologies that in many respects one can learn only from them, that is to say only by installing them and trying them out. The systems

18 These concepts are taken from Heinz von Foerster, 'Perception of the Future and the Future of Perception.' In Heinz von Foerster, ed., *Observing Systems* (Seaside, Cal., 1981), pp. 192-204; Heinz von Foerster, 'Principles of Self-Organization – In a Socio-Managerial Context.' In Hans Ulrich and Gilbert J. B. Probst, eds., *Self-Organization and Management of Social Systems: Insights, Promises, Doubts, and Questions* (Berlin, 1984), pp. 2-24 (8 ff.).

are too complex for scientific prognosis.[19] This means not only that research itself is riskier than the subsequent utilization of its results (we need only remember Röntgen's handling of X-rays), because one first has to investigate and discover the risks and the possibilities of averting them. It also means that results relating to 'domesticated risks' are released for general use without it being possible to control whether the change in context does not itself present risks (be it only because technicians with less expertise and less skill at improvisation are involved, or also because the technology then has to function perfectly for longer periods). Safety technologies themselves, or supervision and warning regulations can also be risky since it cannot be excluded that they will be used in situations for which they were not designed – then providing for a dangerous sense of security. The *post factum* investigations of major accidents such as Three Miles Island or Bhopal provide impressive evidence of this. At the same time they show that corresponding mistakes are also frequent where such spectacular events do not ensue.[20]

These considerations show in the first place that a risk is inherent in the technology itself – simply because it is not nature, but is distinct from nature. Secondly it shows that this risk accumulates as soon as it becomes itself the object of technical processes. Limits are apparently set to any attempt to protect oneself against the risks of technology by technical means. A mere end/means schema and the usual definition of technology as an artificial, instrumental device for the achievement of nontechnical ends the phenomenon of the self-application of technology to its own risks. On the other hand concepts such as 'reduction of complexity', 'functioning simplification', and 'insulation in the interest of repeatability' make it clear the technology severs the world in two with the result that in future two sides become relevant and take real effect: the technically controlled space and the technically uncontrolled one. What is artificial is not the mechanism but the boundary.

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19 See Wolfgang Krohn and Johannes Weyer, 'Die Gesellschaft als Labor: Risikotransformation und Risikokonstruktion durch moderne Forschung.' In Halfmann and Japp, op. cit., (1990), pp. 89-122.

20 See especially Charles Perrow, Normale Katastrophen: Die unvermeidbaren Risiken der Großtechnik, (German translation Frankfurt, 1987).

Certainly, technology is not the only instance of risky decision making. But in the new high technologies it becomes apparent that – and how – risk becomes reflexive. This gives technology in the context of risk communication its exemplary, its paradigmatic significance. The process of simplification and insulation, which entails the risk of a failure to function, is reused to eliminate these risks or at least to mitigate them. This was convincing as long as the risk lies in the failure to function. And insurance against economic failure was possible. However, technology that fails to function no longer comes to a halt but triggers unanticipated effects of possibly catastrophic dimensions. In these circumstances the application of technology to technology becomes a different type of problem. Now the instrumental technology concept is also no longer useful. It is not simply a matter of somehow attaining the same goal in spite of everything. Nor does the notion that one cannot achieve everything – that technology is limited in respect of human beings and nature – do justice to the phenomenon. Technology has no limits, it is a limit; and in the last resort it may fail not due to nature but to itself. This should not, however, be understood apocalyptically. We could just as well say that technology can help only itself, and the trend is clearly towards more risk and more opportunity.

III.

It is quite evident from what we have been saying that technology has ecological consequences; after all it is itself an ecological entity. To ignore this would mean relying on a social construct for technology that promises complete closure with the exception of openings for inputs and for outputs. The difficulty of bringing about these conditions for even a brief period and for only small volumes, i.e experimentally, indicates that any transformation into consumer technologies engenders a multitude of additional problems – precisely as a consequence of the attempt to establish, and in the long term to reproduce, a difference between controlled and noncontrolled causality. This holds for both the massive deployment of technologies that are known and easily controllable under functioning conditions, and for high technologies that are based on an extremely advanced scientific

capacity for dissolution and recombination; that is to say nuclear technology, the chemical synthesizing of new substances, and biotechnology. The linkage between technology and ecology is now public knowledge and within the scope of public experience. As such it is a known factor. The question is whether we can state more precisely where the problem lies and against what background the problem assumes the form that interests us, that of risk.

We are put on the track by the perception that – to conventional technological understanding – ecological problems appear on the monitor as the undesirable side-effects of planned action.[21] This finding alone indicates that they appear in a form that is not itself 'ecological', but visible only in the context of action – as it were as the outside of the planned relation between means and ends. Ecological problems present themselves as perturbations in the system that technology operates. Their 'phenomenology' thus in no way reveals what – as in processing the perturbation one suspects – they 'really are'. They cause surprise, not least of all for those in the know.

If we take technology-aided action as our starting point, we are not dealing with problems of technology failing to function. Such problems continue to exist, and in the more advanced technologies probably more so than in simpler instrumental systems. But ecological problems are actuated precisely by technology functioning and attaining its ends. Although unwanted side-effects, when known, can also be understood as problems to be solved by technology, this means only that these secondary technologies can then for their part again set off ecological problems.

We shall now translate this analysis from an action theory context to a systems theory one. This reveals that the most important function systems, especially science, the economy, law, and politics, are not in themselves equipped to process ecological problems. Science, for instance, takes as the starting point for its investigations the state of the art. It formulates its problems with the help of theories and methods. Ecological problems are introduced so to speak from the sidelines. They have no genuine roots in any discipline, and mostly fail to take

21 We will leave it open whether they are anticipated and whether that can be allowed for as costs and with what degree of uncertainty this can occur.

shape as a scientific problem. We shall be coming back to this point. The economy, too, seeks its bearings for investment and production decisions in itself – namely in the market – and not in the environment of the societal system. Politics, some believe, is in the business of allocating values; it seeks to generate and to satisfy desires that are dependent on collectively binding decisions. When ecological problems are raised, they are not welcomed as a novel topic. They are received more as a perturbation, which one then attempts to get rid of in the usual manner with benevolent promises. The same is more or less true for all function systems.[22] To this extent they are in the image of technology, in that they depend on operative closure and functional specificity.

If this localization of ecological problems as 'undesirable side-effects' is valid, it would explain two interconnected and in these dimensions novel phenomena: (1) the high degree of uncertainty that arises from not raising problems oneself, but being so to speak ambushed by them; and (2) that effects become incalculable, or at any rate no longer – as in the case of a technology failing to function – remain limited essentially to those responsible for planning and execution, and who have then to accept the blow. This is probably the reason for the widespread belief that the risk problems facing us now are novel in type and extent and that the relation between technology and ecology, although far from covering the total range of risky decision making, is nevertheless to the forefront of current debate. But what exactly are the problems that seem novel to us?

An attempt to answer this question also takes recourse to a concept of technology defined in terms of functioning simplification, causal closure, or also as a boundary between controlled and noncontrolled causality. This concept can also be applied to processes within the societal system, for example, to mathematical calculation. In the domain in which we are primarily interested, by contrast, it is a matter of material realizations *outside* the social system and hence of *noncommunicative operations*. Technology in this sense of the term is inte-

22 With one important proviso: as long as they specialize in problems that are to be solved by means of communication. For the educational system other rules may apply, insofar as it deals with enforced socialization, that is to say the alteration of psychic systems.

grated into the ecological context society has to deal with – a fact that is concealed by continuing to proceed on the assumption of a confrontation between nature and technology. In fact, ecological effects – and with them the ecological risks of technology – can be explained only if we take into consideration that the technical artifacts themselves are installed at the level of physical, chemical, and organic reality, and if we attempt to structure *this* reality by means of the difference between controlled and noncontrolled causality. This provides us with a quite different access to the problem of the relations between society and materially constituted technology.

This is not to deny that technical realizations are grounded in a social, communicatively available construction of reality. This may well relate to scientific theory, but only in a very limited and frequently only very indirect manner. What is more important is the general insight that *structural couplings* between the societal system and technical realizations become routinely coordinated. Society comes to terms with the existence of technology. It proceeds on the assumption that technology works. One arranges to meet on the assumption that the car will start. The most important aspect of the structural-coupling concept is that it does not indicate a causal relation and certainly not an instrumental relation, but one of simultaneity. This is not to deny that causalities exist. If the car does not start this will lead to a meeting being cancelled or postponed, to a taxi being called and so on. But these are, so to speak, secondary effects, which can be covered by the concept of perturbation. The basis always remains a primary relation of simultaneity between system and environment. And simultaneity always means noncontrollability.[23]

This consideration has far-reaching consequences. The relationship between society and technology can no longer be understood in terms of the classical technology concept and the end/means schema. Nor does the question of the side-effects of technology and the risks of undesirable effects define the problem. This question is by no means outdated. But it directs attention too exclusively towards more planning, more caution, more additional installations – more technology. The concept of structural coupling goes further in explaining that in those sectors of society that come into contact with technology, corre-

23 See Chapter 2 I

sponding social forms develop that react very concretely to everyday experience. These include, for instance, practices deviating from the rules and somehow or other holding their own – which for their part assume perceived or nonperceived risks (not least of all the organizational risk of being found out).[24] A smoothly coordinated practice – even when dealing with risky technologies – often leads to interpreting warnings in the light of prior experience, to shying away from the necessary adjustment, and consequently to ignoring such warnings. Taking a further concept coined by Humberto Maturana we could also contend that social systems involved with technology get caught in a 'structural drift' that makes use of experience and abilities, modifications of rules, habits and arguments based on prior successes that are understandable and that are difficult for the outsider to controvert – until something unexpected occurs. Afterwards everything is different; afterwards it was 'human error'; afterwards culprits are found; afterwards the rules are changed. But not what matters, namely the structural coupling – which will encourage a repetition of the occurrence in other partial contexts with other adaptations, other experience, and other risks.

Accordingly, structural couplings between society and technology (or to be more exact between very specific social systems and sectors of complex technologies) have a multitude of different, partly conflicting effects. In a large number of fields society comes to rely on technology functioning, and develops its own structures more and more on the basis of this precondition. Second, this is also true of direct commerce with technical installations, including those intended to absorb their risks. Third – and this is the latest trend – it is more and more frequently remarked that the problem posed by technology-

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24 Among the old, tried, and tested traditions of sociological research is discovering social order, even positive functions, in deviance from rules. A case study exemplifying our problem is Joseph Bensman and Israel Gerver, 'Crime and Punishment in the Factory: The Function of Deviance in Maintaining the Social System.' *American Sociological Review* 28 (1963), pp. 588-593; and more in the context of the contemporary interest in technological risks: Brian Wynne, 'Unruly Technology. Practical Rules, Impractical Discourses and Public Understanding.' *Social Studies of Science* 18 (1988), pp. 147-167.

related risks cannot with certainty be solved in this manner. This causes highly unstable reactions aptly captured by Perrow's formula of 'normal accidents'. There is no longer a uniform formula for the overall effect of these different consequences of structural couplings, let alone an idea of how to go about solving the problem. We could tackle all three aspects, and propose (1) reducing the dependence of society on technology, (2) drawing the attention of science and organizations to the 'informal' and inherently risky modes of concretely handling installed technology, and finally (3) saving oneself exaggerated fears and excitement and thus not by this alone triggering preventive misfortune. Each of these proposals is plausible in its own right, and none of them takes into account the cross-linking of the problems. Without seeking to discourage any one of these proposals, sociological analysis can, however, contribute little to promoting their acceptance or to prognostication. It will rather be concerned with the question of how society changes its own structures in the face of structural couplings of this type.

Chapter 6
Decision Makers and Those Affected

I.

We now return to our point of departure, the distinction drawn between risk and danger. In the case of risk, losses that may occur in the future are attributed to decisions made. They are seen as the consequences of decisions, moreover as consequences that, with regard to the advantages they bring, cannot be justified as costs. Neither the type of decision nor the type of loss is what matters, nor the degree of probability or improbability of the consequences occurring. It remains a risk if one takes a beneficial (but not vital) medicine, which in one case in millions can lead to grave damage to health or to death.[1] Nuclear power generation is a risk, even if we may be certain that a serious accident will occur only once every thousand years – although we do not know when. In this question it is a matter of the degree of sensitivity to probabilities and the extent of loss – that is to say social constructs subject to temporal influences.

Thus from these points of view the concept of risk remains open and, as it were, a position from which societal relations and the way they change in the course of history can be monitored. The concept of risk is, however, clearly distinguished from the concept of danger, that is to say, from the case where future losses are seen not at all as the consequences of a decision that has been made, but are attributed

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1 It is a different case – more akin to what we refer to as cost accounting – if it is a matter of retarding or curing a fatal disease with medicines that are in themselves dangerous. This is also normally described as risk, but we should at any rate notice the difference. Someone who without medicine would long since be dead cannot very well regret having taken the medicine, which then in its turn caused death – naturally with the proviso that the extension of his life under such circumstances was for him a positive rather than a negative value.

to an external factor. The distinction risk/danger is, in our conceptual terms, the 'form' of risk, the marking of a boundary, to cross which is to find oneself in the opposite position with completely different conditions and connection options.

A first hypothesis is that distinct forms of social solidarity develop differently depending on whether the future is seen from the angle of risk or from the angle of danger. For this reason we judge self-injury by smoking otherwise than we do damage to our health caused by asbestos contamination. In the first case social regulation collides with notions of liberty, and the notion of passive smoking is necessary to justify regulation. In the other case the need for protection is evident. With respect to dangers, however, society faces a problem that the injured party has not himself caused. This calls for a quality of attention and sympathy different from that of risk, which can rather be entrusted to rational self-regulation. In neither of the two cases can one expect full coverage and social equality in the way advantages and disadvantages are distributed. This makes the law and the economy necessary as compensation mechanisms. Loss itself also strikes with unequal force. The wealthy have more to lose, the poor starve more rapidly. The attribution of culpability is, however, regulated differently. Thus in the Middle Ages the Plague was treated as a sort of Jewish terrorist activity. Under such condition mechanisms of 'victimization', of sacrifice, of purification develop; in the dominant structure of society, however, we find the establishment of norms of reciprocity, of mutual aid, of temporal off-setting of losses that in their individual occurrence were unpredictable. Furthermore, ethics formulated certain qualities of value in the face of dangerous situations, such as courage (but not foolhardiness), sang-froid (*ataraxia*), steadfastness and prowess; or also qualities of religious provenance enabling one to avert or placate divine ire. The superlative, the epic form of this was the hero with his double function of demonstrating how one had to be and of releasing everyone from having to be so himself. The acceptability of political domination was, after all, determined by the fact that it promised protection against danger.

The society of risk knows no heros[2] and no masters.[3] It also discontinues the traditional forms of reciprocity. It replaces the mechanism of aid/gratitude/aid by the organization of the welfare state, thus engendering a climate of rights in which far more help is provided than before – and at the same time disappointment increases.[4] The juridical form for this is the 'subjective right', abstracted from all reciprocity of rights and duties and satisfied with mere complementarity.[5] In the old world, too, social reciprocity was naturally calculated rationally on the basis of individual advantages and disadvantages. The development should not be seen as a loss of emotional intimacy and security. Reciprocity can be just as coolly calculated as rights *vis-à-vis* organizations; but one cannot activate reciprocity without the other party being willing to provide counterperformance – whereas laying claim to organized help commits the claimant to nothing.

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2 It would be an interesting task to look for exceptions and to contrast the given social conditions with a shift in notions of the future in the direction of increasing sensitivity to risk. An example is offered by the inventor within the context of the faith in progress. We could also perhaps consider the hero-worship associated with the early days of aviation (Lindbergh, etc.), where one could proceed on the assumption that the aviator was gambling only with his own life and not, by a possible crash, with that of others. Thus we would have to modify our text and admit that there are indeed attempts to smuggle heroism into the society of risk and to give it new literary shape. But precisely the form in which this has been attempted provides our thesis with a valuable insight, and for the rest is now antiquated.

3 As 'master' we understand someone who can ignore being observed; also, in contrast to 'servant' someone who can avoid the perspective of second-order observation.

4 See François Ewald, *L'état-providence* (Paris, 1986). In Germany the debate on the provision of existential welfare services by the state 'Daseinsvorsorge' (Forsthof) and the problems this gives rise to in the context of the rule of law began already towards the end of the 1950s.

5 See Niklas Luhmann, 'Subjektive Rechte: Zum Umbau des Rechtsbewußtseins für die moderne Gesellschaft.' In Niklas Luhmann, ed., *Gesellschaftsstruktur und Semantik*, Vol. 2 (Frankfurt, 1981), pp. 45-104.

One of the peculiarities of organized help is that it is in no way conducive to solidarity.[6] The distribution of risks and dangers does not encourage this. The future is couched in terms of future decisions, and the resulting built-in instability is to a certain degree corrected by law. For the beneficiaries this does not primarily represent a risk but a danger. There is no risk because they do not themselves have to make any decision on prior performance, but have simply to fill out forms for applications that might possibly be rejected.[7] The danger is that organizations can, by making a decision, change the conditions under which they grant applications. The applicant is exposed to risk to the extent that he relies on the perpetuation of these conditions and organizes his life accordingly. This risk is thus a motive for seeking legal safeguards or political contacts, which would if necessary permit the prevention of any alteration in conditions. In a peculiar way, organized flexibility thus nurtures an immobilism that blocks it, an immobilism maintained by the permanent recourse to the law and politics. Form is applied to form, distinction to distinction. Sensitivity to the slightest differences grows, but no social confidence comes into being that would be capable of encouraging and providing a basis for time-binding performance.

II.

Risks are aspects of the observation of decisions, including observation by the decision maker himself (self-observation). However, if we take the individual human being as our basis, there are in the world some five thousand million decision makers, making innumerable de-

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6 We make this contention well aware that in the second half of the nineteenth century the cooperative movement and similar undertakings attempted just this. See Robert Hettlage, *Genossenshaftstheorie und Partizipationsdiskussion* (Frankfurt, 1979). On French parallels see also Dieter Grimm, *Solidarität als Rechtsprinzip* (Frankfurt, 1973).

7 There are exceptions to be noted in this field as well. Thus in the domain of subsidies for science the application for support frequently represents half the research to be undertaken, or is at least so comprehensive that many shy away from the risk of wasted effort.

cisions every day of the week, and doing so simultaneously. If we consider the organization, we are still dealing with large numbers; and its externally effective decisions (decisions attributed to the organization) are in their turn the product of innumerable internal decisions. Interest in rationalization does nothing to reduce the quantity of decisions made. It does quite the opposite.[8] There are important and typically modern mechanisms for absorbing and differentiating sets of decisions. We will mention only the best known: markets and hierarchies. For the same reason a regional differentiation of the global political system by the formation of states – and that always entails the danger of war – remains indispensable for the time being.[9] Even if we take all this into account, it changes nothing in the trivial insight that not everyone can always participate in all decisions. 'Humankind' cannot decide. We have anticipated this with our title for this chapter: there are always those who make decisions and those who are affected thereby. Decisions engender affected involvement (*Betroffenheit*). Being affected (*Betroffensein*) is thus a counterconcept to decision making – or we can at least say that this position explains the present semantic career of the expression. How the boundary between those affected and those not affected is then to be traced is a question of social construction that would have to be investigated in its own right.[10] Now those not affected increasingly declare themselves to be

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8 On organizations see Niklas Luhmann, 'Organisation und Entscheidung.' In Niklas Luhmann, ed., *Soziologische Aufklärung*, Vol. 3 (Opladen, 1981), pp. 335-389. However, the same argument also applies with regard to individuals, for example, comparing prices before buying, or trying out partners before marrying.

9 We can also describe this as the transformation of an insoluble problem into a soluble problem: instead of participation by everyone in all political decisions, we have the problems of preventing wars; perhaps even the problem of reducing the *danger* of war by increasing the *risk* of war.

10 The notion put forward (albeit without sufficient elaboration) by Chauncey Starr and Chris Whipple, 'Risks of Risks Decisions.' *Science* 208 (1980), pp. 1114-1119 does not seem to me to be tenable. According to these authors, the decision maker calculates a *societal* risk, whereas those affected by the decision react *individually*. This would mean that decision makers were more or less automatically (simply because they decide?) representatives of society and that the problem consists only in a

affected – for example, whites by discrimination against other races, or the replete by the existence of hunger in other countries. Affected involvement thus increasingly becomes a matter of social definition, of self-determination on the individual and organizational levels. Nevertheless, the following considerations require only the distinction between the decision makers and those affected by the decisions made. And we can call it a 'form' of decision making that it engenders affected involvement.

Like every other form, this one has two sides to it. On the side of decision making ('inside' the form) we can look for ways to improve things, we can thus rationalize, carry out more complicated calculations, or introduce computers; or we can take the perspective of those affected (the other side of the form); we can, for example, round off sharp edges or deploy appeasing communication. This does not change the form in any way, nor does it lead to a dialectical 'cancelling out' of the distinction. Affected involvement remains the other side of the form, and the affected party sees the decision (even if the constraints thereof are thought about) differently from the way the decision maker does. It is an irrevocable duality – which does not necessarily constitute a conflict.

We can formulate the same problem using the terminology of second-order cybernetics or the terminology of the observation of observers. The decision maker may observe those affected in their capacity as observers of the decision making process. Those affected may observe the decision maker in his capacity as observer of those affected. This does nothing to change the fact that every observation (be it of the second or third orders) is *an operation in its own right* and like every other operation proceeds blindly. Even the most reflexive of observers does not see what he does not see; he uses a distinction that at the moment of use he cannot distinguish (for to do so he would have to make use of a further distinction for which the same is true).

'balancing of public benefits and involuntary risks to the individual' (1114). The problem is then shifted to distinguishing between social (quantitative) and private (intuitive) risk evaluation and the conflicts arising therefrom. But why should the decision makers rather than those affected represent society?

The operation of observing cannot observe itself but only what it distinguishes as operation.[11]

These thoughts have been formulated in highly abstract form, and their relevance goes far beyond the topic of risk and danger. However, for this very reason they render possible an interpretation of the distinction of risk and danger fraught with consequence for scientific investigation. In brief, risks are attributed to decisions made, whereas dangers are attributed externally. From a sociological point of view this would be relatively unproblematic if these matters could be kept meticulously separate. An analysis of decision making and affected involvement indicates that this does not occur. It shows that the risks the decision maker takes and has to take become a danger for those affected. Within the decision making process itself, one cannot avoid attributing consequences to decisions (otherwise the decision would not be recognizable as a decision). Thus one can also not avoid an attribution of future loss and has to accept it as risk where it cannot be entered under costs. The affected party finds himself in a quite different situation. He sees himself as endangered by decisions that he neither makes himself nor controls. Self-attribution is not possible for him. He is dealing with dangers – even when he sees and reflects that, from the point of view of the decision maker (perhaps himself!), it is a matter of risk. We are confronted by a classical social paradox: risks are dangers, dangers are risks – because it is a matter of one and the same content observed in the medium of a distinction requiring two differing sides. The same is different.[12] We find ourselves on the same theoretical level as the paradoxes of normative (counterfactual) validity and scarcity. However, *it is not a matter of these paradoxes, but of a different one*. We have in mind a much more profound justification for the thesis advanced in the previous chapter, that risk problems

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11 For this very reason it is theoretically important to link up the concept of observation with the concepts of drawing distinctions and indication, for this makes it clear that the operation itself executes the paradox of the unity of a duality (duality as unity) and is *therefore* forced to *indicate one* of the sides of the distinction (and not the other).

12 'The Same is Different.' the title of an essay by Ranulph Glanville, published in Milan Zeleny, ed., *Autopoiesis: A Theory of Living Organization* (New York, 1981), pp. 252-262.

cannot be solved by means of the institutions and methods developed in the system complex of law and economy. We are dealing with quite differently grounded problems, even if in all these cases we are dealing with the tension between the time dimension and the social dimension.

And how does this paradox present itself? How are the possibilities of observation restored? The typical mechanism is to substitute another distinction, which replaces the paradox. Possibilities for observation are thereby created and the paradox itself rendered invisible. In today's environmental parlance, for example, a distinction is drawn between destroyers of the environment and environmental protectionists; or between industry on the one side and the supporters of ecological interests on the other. The problem can then be set in relation to persons or to organizations, and described in terms of an opposition of interests or a conflict of values. This semantics is a burden for politics; it calls for a political solution to the conflict. It describes persons or organizations with their respective differing characteristics and concludes the analysis with a description of the conflict and its own commitment.

We go beyond this if we use the level of second-order observation; that is to say, if we describe how observation and description are undertaken from the point of view of each of the two sides.[13] We thus gain the detachment that permits us to observe what others observe and what they cannot observe. We understand and describe the conflict as a consequence of social conditions without being forced by our own mode of observation (which is just as dependent on individual distinctions as is that of the others) to take sides. And we can analyse with greater precision what structural and technological developments in modern society have led to the risk/danger syndrome absorbing more and more attention and more and more communication. Given a correspondingly developed sensitivity in attribution, *all* deci-

13 Stephen Cotgrove, 'Risk, Value Conflict and Political Legitimacy.' In Richard F. Griffiths, ed., *Dealing with Risk: The Planning, Management and Acceptability of Technological Risk* (Manchester, 1982), pp. 122-140, uses the concept of 'paradigm' to describe how 'industrialists' and 'environmentalists' formulate their view of the problem, i.e., how they describe what they can observe from their niche.

sions are risky. *But one man's risk is another man's danger.* How is a the social order to cope with this? And what social (political) institutions will develop to resolve this paradox?

III.

Prior to the advent of the ecological threat, one could more or less proceed on the assumption that risks essentially affected the decision makers themselves. The problem was one that could be tackled with socially delimiting categories. Within the relevant group the relevant knowledge, indeed often sufficient solidarity and comprehension could then develop. It was not a universal problem. The risk of serving at court in the early modern era characterized the person who assumed it and made a career at court – in contrast to that category of nobility who ventured nothing and thus had nothing to gain, but were satisfied with running their estates. In the industrial age, too, the dangerous nature of work – for instance that of the foundry worker or the miner – could be the pride of a whole occupational group, which made the closing down of plants or pits a particular problem. No other work could provide compensation for this pride. For those affected by them, risky activities therefore constituted a mark of distinction. And to a certain degree they remained under control. The relevant skills could be developed and learned. But not everyone had to be a hero or even to risk such exposure.

As the environment of the social system becomes involved in the concatenation of possible losses it changes,[14] doing so from two different points of view. In particular, the three categories of decision maker, beneficiary and affected party can become more starkly isolated from one another, so that they can no longer be subsumed under a single social category, a social group, a context of behavioural norms. Thus the direct neighbours of dangerous industrial plants are in the first place affected parties, but due to their interest in employment also beneficiaries. Whoever lives at a greater distance enjoys at

14 See also Christoph Lau, 'Risikodiskurse: Gesellschaftliche Auseinandersetzungen um die Definition des Risikos.' *Soziale Welt* 40 (1989), pp. 418-436.

the outside the advantages of reliable supplies even in the event of bottlenecks. Neither of the two groups is normally counted among the decision makers; and the decision maker, contrary to popular prejudice, is in no way necessarily the party that profits from the decision. It probably differs very much from case to case. What interests us at this point is simply that it is hardly possible any longer to group together such heterogeneous types of participation and affected involvement into social entities *that can be distinguished from others, and thus endowed with a distinct quality*. The syndrome of participation/affected involvement permits no conclusive differentiation – be it with regard to role, occupation, organization or any other aspect – as a social system. The sociologist would have to bring in a verdict of anomie.

We have an even more striking case when it is no longer possible to determine who is to be counted among the parties affected by decision making. This might depend on the direction of the wind, or on whether the disaster occurs next year or a thousand years hence. Who will be those affected by the demographic explosion? Only the inhabitants of the so-called 'third world'? And if the polar ice melts, will the inhabitants of higher ground not be affected? And if the world economy collapses who could survive if no one takes his money? It is only this sort of diffuse affected involvement in cases that are extremely improbable but not to be excluded that makes the asymmetrical structure of the problem clear: social intervention must attack at the point of decision, not at that of affected involvement. And quite independently of the type of intervention. Those affected constitute an amorphous mass that cannot be given form.

Moreover – coming to the second aspect announced above – the experience of those affected decreases in proportion to the corresponding risks They have to replace experience by notions that remain abstract and can be shaped by communication. This is due not only to the dependence of risk on decision making, but also to the extent of system and role differentiation in modern society. And it is also due to the increasing importance of cases of loss and damage that are extremely rare (that have never been experienced), but which – when they do occur – are catastrophic in their effects. The elimination of opportunities for experience encourages the development of socially inflammable fears that cannot be countered. Or vice versa, it gives

rise to a reassurance fostered by the circumstance that 'so far nothing has ever happened'. The latter instance can be observed primarily in the domain of safety technologies, and has frequently been evidenced by studies following the occurrence or near-occurrence of a disastrous accident. Taken together, these two aspects lead to a concurrence of overestimated and underestimated risks, further exacerbating the already existing risk problem.

The universalization of affected involvement is evidenced already by ethical, humanity-related postulates; and also by the fact that some feel affected alone by the affected involvement of others. But especially recent developments show that social problems that can no longer be formulated as group problems seek expression in communication; that is to say in the most general social medium for the establishment of order and disorder. However, since the group of those affected can be neither delimited nor organized, they have to be 'represented'. Since a majority democracy legitimated by political elections already exists, this can take place only parademocratically, thus by *de facto* self-authorized representation drawing its legitimacy from the topic as well as from the incontrovertible nature of the problem. We will be taking this up again in our analysis of protest movements (Chapter 7). At the moment we are interested in the more general question of whether and how it is possible to assert in communication the indeterminable nature of affected involvement, which is only to be defined in contrast to decision making. Is it not an illusion to expect more communication (or as variations: more information, more knowledge, more participation, more learning, more reflection) to provide the remedy? Will not more of all these things rather contribute decisively to widening the gap between decision makers and those affected? All the more so, since for both parties the future, being in the probability/improbability mode, remains in the last instance indeterminable – and since the only thing that is certain is that the other side, too, cannot offer certainty?

IV.

At present empirical research confirms the discrepancy we have presented here only in abstract form, and draws the attention of the re-

searcher to the hope of balancing out or at least reducing the difference by means of *communication.*[15] Attitudes towards risk can, it is hoped, be 'objectivized' , first, to guide the individual in his the willingness to assume risk, insofar as his attention and the precautionary steps he takes can be effectively engaged[16]; and second, to eliminate worry and anxiety that could lead to attacks on what is felt to be 'reasonable' willingness to take on risks. Attempts to effect changes in attitude by using given knowledge are probably less likely to be successful that those that proceed by providing surprising information, which the recipient then has to incorporate into the context of his understanding.[17] Taken as a whole, the contribution of empirical (primarily social psychology) research is – as always – burdened with any number of 'ifs' and 'buts', and is difficult to generalize beyond the particular complex being investigated. The hopes set in communication may be disappointed. It has to be tested in practice. At any rate, a conclusive evaluation at this point would be premature. We shall thus restrict ourselves to a brief statement of position.

Empirical research shows above all that the willingness to take 'risks'[18] depends on how firmly we believe ourselves capable of keeping precarious situations under control, of checking a tendency towards causing loss, or maintaining our coverage by means of help, insurances, and the like in the event of losses occurring. It is not infrequent to overestimate our own competence while underestimating that

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15 See from the political point of view: William D. Ruckelshaus, 'Science, Risk, Public Policy.' *Science* 221 (1983), pp. 1026-1028. On the necessity but also the difficulties of thus informing the public see also Paul Slovic, 'Informing and Educating the Public About Risk.' *Risk Analysis* 6 (1986), pp. 403-415).

16 See Chapter 1, ...

17 This is indicated by a number of results of empirical studies in the fields of consumer protection and industrial safety, the generalizability of which is, however, still to be investigated See W. Kip Viscusi and Wesley A. Magat, *Learning about Risk: Consumer and Worker Responses to Hazard Information* (Cambridge, Mass., 1987), pp. 6, 124.

18 The term 'risk' as used in this context is vague concept, not taking into account the proposed distinction of risk and danger. At any rate, a choice in deciding or accepting is presupposed; the whole question would otherwise be meaningless.

of others. This permits a willingness to take risks that must appears dangerous to others.[19] But even in the absence of any such 'self-serving bias of own competence', a certain willingness to take risks may have such psychological collateral that any such propensity is not affected by changes in objective conditions, but is, as it were, kept in tow. This means, for example, that the safety technologies in industry or the construction of safer roads objectively raise the willingness to take risks, thus sabotaging the point of the exercise. Whoever knows himself to be covered can risk a great deal more with the same degree of risk willingness. We may furthermore assume that the decision maker is more likely to believe himself to be in a position to cope with future losses than is an affected party. At least the decision maker, in contrast to the affected party, has the possibility of taking into account his expertise, his self-confidence and his collateral when making his decision; whereas the affected individual has to be content with believing that *others* will keep the situation under control. Such confidence in experts, in technologies, in the promises and scrupulosity of others is being progressively undermined; it is being ruined by the rigour of the difference between the perspective of risk and that of danger – and is dwindling in proportion to the danger not being due to natural events (for example, the impact of a meteorite) but to decisions made by others. We accordingly find that the general public evaluates risk and the possibilities of averting it differently from the way this is done in the political arena; that the layman takes a different view from that taken by the expert.[20] Under certain condi-

19 In traffic, for example. See Ola Svenson, 'Are We All Less Risky and More Careful Than Our Fellow Drivers?' *Acta Psychologica* 47 (1981), pp. 143-148, with further references to research on the subject.

20 For a (probably the first) representative survey, see Gerald T. Gardner and Leroy C. Gould, 'Public Perceptions of the Risks and Benefits of Technology.' *Risk Analysis* 9 (1989), pp. 225-242. For reports on the hitherto primarily psychological research see Paul Slovic, Baruch Fischhoff and Sarah Lichtenstein, 'Perceived Risk: Psychological Factors and Social Implications.' *Proceedings of the Royal Society of London* A 376 (1981), pp. 17-34; Paul Slovic, 'Perception of Risk.' *Science* 26 (1987), pp. 280-285.

tions, above all under the conditions of risky technologies, confidence in the self-confidence of others evaporates.[21]

Experience with this loss of confidence has now been accumulating over a period of two to three decades, and the public has begun to react. Campaigns are organized with a mutual deformation of points of view. Among the remedies proposed are the hopes set in communication, in dialogue, in comprehension, and in the willingness to compromise. The topic of risk communication has meanwhile also got through to the sciences.[22] But can communication help where mistrust prevails and where the participants, as we have shown above, observe on the basis of different distinctions? Or will the gap between decision makers and those affected finally destroy the (still widespread) hopes in learning and communication, or even the sociologically naïve expectation that more would be a good and not a bad thing?[23]

Explicit communication is in the first place only an operation bringing a diffuse world into focus on a statement, which in the further course of communication can encounter a positive or negative re-

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21 We can also argue inversely: the indisputable fact of such an evaporation of confidence is an indicator for the relevance of the distinction of risk and danger.

22 See, for example, Ralph L. Keeney and Detlof von Winterfeldt, 'Improving Risk Communication.' *Risk Analysis* 6 (1986), pp. 417-424, where the problem is reduced to a decision making problem; also Helmut Jungermann, Roger E. Kasperson, and Peter M. Wiedemann, eds., *Risk Communication* (Jülich, 1988); Helmut Jungermann, Bernd Rohrmann, and Peter M. Wiedemann, eds., *Risiko-Konzepte Risiko-Konflikte Risiko-Kommunikation* (Jülich, 1990). For a rather sceptical stance see Harry Otway and Brian Wynne, 'Risk Communication: Paradigm and Paradox.' *Risk Analysis* 9 (1989), pp. 141-145. A brief survey of problems discussed hitherto is also to be found in Vincent T. Covello, Detlof von Winterfeldt, and Paul Slovic, 'Communicating Scientific Information About Health and Environmental Risks: Problems and Opportunities from a Social and Behavioural Perspective.' In Vincent T. Covello et al., eds., *Uncertainty in Risk Assessment, Risk Management, and Decision Making* (New York, 1987), pp. 221-239.

23 'Sociologically naïve' in relation to knowledge long available elsewhere, for instance on problems of the social aggregation of individual preferences.

sponse – an operation that can thus progress by means of acceptance or rejection. This openness to 'yes' and to 'no' is a condition for the autopoiesis of society as communication system. By means of corresponding linguistic coding it prevents there being finally nothing more to say because everyone has agreed on everything. It is self-evident that the chances of the 'ayes' and the 'noes' are not equally distributed, and in the normal operation of society it is sufficiently predictable whether in communicating a particular content one will meet with a 'yes' or a 'no'. This results in a preponderance of accepted as opposed to rejected communication. This is, however, neither a consequence of the nature of communication nor, as Habermas contends, due to a norm intrinsic to communication that recognizes only consensus-orientated communication as being rational; the high proportion of consensual communication is the result of the continuous calculation of calculations,[24] that is to say the outcome of a recursive networking of all individual contributions to communication. This theoretical concept accordingly replaces appeals to a reasonable willingness to establish a basis for communication[25] by the question of what structural burdens such a system can withstand. The historically most important example is the introduction of writing and then its dissemination by the printing press, entailing a complete reorganization of the semantics relating to the consent and dissent of absent and unknown readers. We shall not contend that the discrepancy between

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24 Using the terminology of Heinz von Foerster. See *Sicht und Einsicht: Versuche zu einer operativen Erkenntnistheorie* (German edition Brunswick, 1985), p. 31.

25 Appeals which, when introduced into communication, have the unpleasant effect of expecting *others to behave reasonably or unreasonably*. In the seventeenth and eighteenth centuries, problems of this sort (at that time principally differences of opinion on religion and politics) were already being dealt with by means of much more cultivated conduct, such as topic avoidance, conflict avoidance, tact, humour. However, this solution depended on class-specific socialization. As a political convention it was hardly up to withstanding more severe testing, especially under democratic conditions. See on the example of the American slavery conflict: Stephen Holmes, 'Gag Rules or the Politics of Omission.' In Jon Elster and Run Slagstadt, eds., *Constitutionalism and Democracy* (Cambridge, England), 1988, pp. 19-58.

the risk perspective and the danger perspective will actuate similarly radical, revolutionary changes. But we should at least bear in mind the question of how a smoothly running recursively networked (autopoietic) communication system can adapt to the novel manifestation of such structural tensions.

A somewhat different version of the problem appears if we consider the narrow-gauge sequentiality of the flow of communication. Only one thing at a time can be communicated and understood, and our consciousness also has only a limited surplus capacity that varies from individual to individual.[26] The consequence is that communication must to a large extent claim *authority* for itself – authority in the sense of assuming the capacity to provide further explanation.[27] The sources of this authority vary, however, in accordance with social structures. In simple societies it may be seniority, in advanced civilizations it might be social rank, and in contemporary society occupational knowledge (official knowledge) or expertise. It is at this sensitive point that the loss of confidence sets in. How do we treat a doctor whom we no longer trust (in view of the current knowledge/ignorance of side-effects) really to have controlled or to be able to control the risks of medication? We ask questions and attempt to test him; but this presupposes that we have expert knowledge ourselves, and above all it requires time (and the waiting room is full). In brief, authority that serves to ease the burden on communication cannot be replaced by communication. But how else could one react to the loss of authority: by unbelief, by loud protest, by resignation, by espousing the latest fashions in esotericism that prescribe what really matters?

Moreover, every communication 'on behalf of ...' requires organization. In the case of communication on behalf of affected parties

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26 In this regard we must naturally neglect the fact that consciousness is primarily organized to process perceptions simultaneously, and has developed a high degree of complexity for this purpose. Linguistic cognition is largely determined by the sequentiality of communication, even it can operate somewhat faster and can accept fuzzy or half-elaborated thoughts.

27 'Capacity for reasoned elaboration' in the sense of the expression as used by Carl J. Friedrich, 'Authority, Reason, and Discretion.' In Carl J. Friedrich, *Authority (Nomos I)* (Cambridge, Mass., 1958), pp. 28-48

there is the additional problem that we are not dealing with a definable group (such as citizens in the case of political elections or members of the workforce in representation by the works council). This leads to organizations of affected parties forming on the basis of self-authorization and without legitimacy. This gives rise all the more to suspicions that self-selection and functionary motives play a role in the process of organization formation, motives that do not directly and authentically relate to a person's affected involvement. It is likely to be all the more difficult to attribute communication motives to risky situations and to distinguish them from an already existing disposition to protest.[28] Communication by those speaking on behalf of affected parties is thus in the last resort no more credible than that by spokesmen for science or technology.

It is not our purpose to discourage communication and attempts to establish a basis for understanding from the outset. We may be certain that the possibilities are far from having been exhausted. The problem of the discrepancy, no longer relating only to law and economics, is too new for us to be able to expect behaviour that spontaneously adapts to it. The points of view presented by the decision maker and the affected individual, by the representative of industry and by the Green politician are such a simplification that the observer must have the impression that whoever expresses himself in such terms cannot be sincere. Too garish a picture is painted, the effect is designed for the mass media, one finds oversubtle strategy discussions but insufficient reflection on the structural origins of the conflict and the valid grounds of the opponent. The way we present this is perhaps in its turn exaggerated,[29] if only to stress that there is much room for improvement. But we must keep in mind the question of the degree to

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28 'Is opposition to a technology really based on a concern about risk, or is it just a surrogate for more fundamental social concerns?' is the question also put by Dorothy Nelkin and Michael Pollak, 'Public participation in Technological Decisions: Reality or Grand Illusion?' *Technological Review*, Aug./Sept. 1979, pp. 55-64 (62).

29 But see the descriptions and quotations in Dorothy Nelkin, ed., *The Language of Risk: Conflicting Perspectives on Occupational Health* (Beverly Hills, 1985), where the conflict is, however, exacerbated by the classical opposition of employer and employee perspectives.

which improvements in communication style and the willingness to find a basis for communication are adequate to deal with a problem of this sort.

V.

We have defined risk by attribution to decisions, and have proceeded on the assumption that with the transition to modern society and its full development, the difference between past and future and thus the dependence of the future on decision making have grown. What, however, is the position with regard to the attributability of risks to decisions?

Attribution to decision making is causal attribution. It has to be conceivable in the schema of cause and effect; and it must furthermore be plausible that the decision maker can also see himself as the cause of the effects he triggers. Causality, however, is a schema of primary observation, embedded in an infinity of further causes and further effects. The further the time horizon retreats, the more comes into sight. Every technical realization (including the 'natural laws' projected for this purpose) thus always represents only a small excerpt from the catenation of equally valid causes/effects. Within the horizon of decision making, a distinction between intended and unintended effects, or in a somewhat different guise, between goals and constraints, must necessarily arise. But these are only second-level distinctions, applied to the infinity problem contained in the causal schema as such. The more complex the calculation of causal context attempted by the decision maker, the more important the unintended as opposed to the intended effects become, the more vital the constraints as opposed to the goals. Any effort at achieving rationality shifts the centre of gravity towards impracticability, thus condemning itself to failure.[30]

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30 From very specific points of view this is already the subject of a great deal of debate – thus on the concept of 'bounded rationality' (Simon) and on the problem of the loss of motivation in the course of extensive rationalization. See Nils Brunsson, *The Irrational Organization: Irrationality as a Basis for Organizational Action and Change* (Chichester, 1985). The

In contrast to such immanent constraints on the rational control of causalities, the process of attribution evidences a certain mobility. Thus, for example, the 'perpetrator principle' in the law relating to liability is handled with a great deal of opportunism. The party in a position to pay is made responsible (for example, industry, but not the consumer whose demand triggered production); or one imposes 'absolute liability' on the party suspected of having the best control over alternatives. Little account is taken in this context of the possibilities of rational calculation. Business risks are increased by liability risks on the not unjustified assumption that the costs incurred will be passed on to prices in any case. The indirect effects on the economic system of such a practice is not taken into account, although here, too, there are risks – risks of a certain form of coping with risks.

Attributing risks to decisions therefore also occurs without a guarantee of rational decision making being possible; indeed, without taking into consideration the rationality of risk calculation, and not infrequently even when the decision maker cannot be identified whose decision has caused the misfortune, who has supplied the last straw that breaks the ecological camel's back, who has triggered the stock exchange crash. Often the only thing that is certain is that decisions were involved, and that only widespread and general precautionary or loss-spreading measures can be of any use.

The *observation* of risky decision making and the incorporation of this linkage of decision and future are in their turn communicated in the common *descriptions* of modern society, are themselves actual operations. They thus affect the further evolution of the societal system. We must therefore expect society in its self-description to exaggerate what it is dealing with – especially if it is new, if it is deviant, if it has problematic consequences requiring correction. We must then allow for the possibility that modern society attributes *too much to decisions, and does so where the decision maker (whether an individual or an organization) cannot even be identified.* The mechanism of attributing risks to decisions is *circular* in operation. The uncertain negative consequences that one can attribute to decisions are taken as

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'externalizing' of costs, as unavoidable as it is readily criticized, should be seen in this context. As far as we can judge, there is no corresponding research into losses in attributability arising for the same reasons.

the risk of the decision. And for this reason the environmental changes actuated by the structured complexity of society, and what one wants to be regarded, treated, and averted as risk are taken, vice versa, to be *the consequence of decisions*. This occurs even when the decision maker cannot be pin-pointed, and there is consequently neither a possibility of calling him to account nor an opportunity for him to learn from the situation. The attribution of losses to decisions is, so to speak, an empty operation, assuming secondary functions (or dysfunctions as the case may be) – for example, to alert public attention, to stimulate protest movements and social criticism, to crystallize prejudices and worries about the future – to name only the most important ones.

A large number of questionable consequences of modern social structures have these effects. This is true of most long-term ecological changes, one of the principal concerns of the present era. But it is also true for the long-term consequences of economic developments, dissimulated by the structure of the money economy. Or in other words, it is true for everything not dealt with in the extreme short-sightedness of market-related calculation. In very many and very typical cases the causal context excluded from the calculations of technology and decision making nonetheless asserts itself. In the ecological context we find (1) extremely long stretches of time between cause and effect; (2) a very high number of contributing factors – which excludes the evaluation of threshold values, of date of occurrence of loss or damage, and of time required for countermeasures. This causal situation above all excludes both identification of the guilty perpetrator and the demand to include the calculation of the risk in the decison-making process.[31] All that can be done instead is to rely on the enacting of provisions, which in a simple sense are risky in their turn; on the one hand in issuing clearance certificates and on the other hand in the setting up of unnecessary obstructions. The situation in the economy is no different, without one being able to charge to anyone's account a possible collapse of the economy or even just severe capital supply bottlenecks that lead to an increase in risky behaviour. Money is a medium that

31 This has already attracted a great deal of attention in legal literature. See, for example, Mary Margaret Fabic, 'Hazardous Waste Pollution.' *Buffalo Law Review* 29 (1980), pp. 533-557.

functions without memory and with amenability to prognostication. Where it comes from and for what purposes it will be used in the hands it falls into next cannot be taken into account in calculating individual transactions: an extreme case of technical simplification displaying neutrality towards all ambient causalities. Instead we have nervous financial markets and the money supply policy of the central banks – thus in this case, too, risks at another level of the same system, but no possibilities of control, only short-term react to a current state of information. For further treatment of this topic see Chapter 9.

We may well ask ourselves whether these cases can still be dealt with in terms of the distinction between risk and danger, and whether the decision maker and the affected individual can still be kept apart. Depending on the attribution perspective taken, it is a matter of risks that would not arise were the future in our society not so completely dependent on decision making. One can also – we are doing it now – identify risks as dependent on decisions. On the other hand there are no alternative decisions, no possibility of risk-free behaviour. To this extent the distinction fails. The risk is the danger. The space distinguished is the same. The distinction permits no operations on one or other of the sides. It can only be observed as a paradox, only as the unity of the distinguished spaces. And this is perhaps the reason why one looks for solutions at the meta-levels of the respective systems, after the development of the paradox in the sense of the well-known hierarchy of types: after establishing a meta-level of the legal regulation of legal conduct, or of a financial market where money is traded and where quantitative control is possible. But in the strict sense of the term as used by the Palo Alto School, it would be a double bind if one were to believe that risks could be averted or reduced in this way.

VI.

In the old world, if we may permit ourselves so sweeping a statement, affected involvement due to the decision of others could to a large degree be regulated via the dichotomy of confidence and mistrust. The assumption was that others had the option of deciding for or against losses. In particular, confidence placed in someone could be abused to the detriment of the person placing it, and, for this reason,

wisdom lies in deciding between confidence and mistrust. In the close-knit social relations in simple societies, but also in early urban cultures, it was difficult to ignore calls for aid or the exchange of favours; mistrust or rejection would have been interpreted as hostility. Confidence (in the Roman sense of *fides*) was an unavoidable element of social solidarity.[32] Later on more strongly personalized relations of confidence evolved. The risk was then trusting someone in cases where, as it could subsequently prove, mistrust would have been more appropriate.[33]

In such cases, however, the relationship between making a decision and being affected by it was quite differently structured. The risk lies on the side of the affected party. He had to decide whether he wished to expose himself to impossible losses caused by others or not; and for him it was therefore important in the case of a breach of confidence to receive social and if necessary legal help, and not to be left standing. This presupposed that the person to be trusted or mistrusted could himself decide directly on the question of loss/non-loss. (He was in a position to deal carefully or carelessly with borrowed things; he could abuse the powers of disposal vested in him, etc.) The social regulation of relations of confidence could thus take as its starting point the indicators of the damaging behaviour to be expected, and then with respect to assessment provide partly for social facilitation (for example, by imposing legal penalties for breach of confidence), partly for indi-

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32 This may incidentally explain why in Roman law gratuitous favours (for instance *mutuum*, *depositum*) were very early on counted as among the few legal relations recognized as such and provided with an *actio*, that is a right of recourse to the courts, although it was not at all a matter of disturbance of performance in a strictly synallagamatic relationship. The need for legal protection thus arose by no means only due to the development of a money economy, but also to the perpetuation of archaic tribal relations of friendship and confidence that one could not escape.

33 For more detail see Niklas Luhmann, *Vertrauen: Ein Mechanismus der Reduktion sozialer Komplexität*, 3rd edn. (Stuttgart, 1989); Niklas Luhmann, *Familiarity, Confidence, Trust: Problems and Alternatives* (Oxford, 1988), pp. 94-107. On the relations between risk and confidence (although using a different concept of risk) also Anthony Giddens, *The Consequences of Modernity* (Stanford, Cal., 1990), pp. 26 ff., 79 ff., 124 ff.

vidualization – as a risk inherent in the confidence itself. The legal concept of *bona fides* was the instrument that in many centuries of civil law development finally led to the enforceability of all contracts (including the so-called *nudum pactum*). And in a parallel development, the risk of confidence that the individual could reasonably be expected to assume increased with rising demands on knowledge of the world and business (*prudentia*).

No one will claim that this is no longer of importance today. It must, however, be made clear that the current urgent problem of affected involvement due to decisions made by others is situated quite outside this confidence zone and can therefore not be absorbed by corresponding institutional or individual precautionary measures. For the typology of cases in which we are primarily interested, the old form of confidence/mistrust is no longer of any use. Such cases can no longer be dealt with via this form, either socially or individually. For the confidence/mistrust form presupposes that we can say how someone has to conduct himself to be worthy of such confidence, to earn it, to betray it. If, however, the risk is situated on his side, then this precondition is void. It is no longer a question of whether he wants to cause damage to others by breach of confidence; it is also no longer a matter of the motivation for trusting and trustworthy behaviour. The aid and support offered by this programme do not fulfil the purpose. For the problem lies in the risk of the decision maker, which eventually makes others into affected parties, who – and this is the point – did not anticipate being affected. We must therefore experiment with new forms of social regulation for risky behaviour, and only one thing is certain: it will not be possible to take recourse to the old ethics of confidence, that is to say, to demand confidence while also demanding caution and circumspection in the placing of confidence.

Chapter 7
Protest Movements

I.

Social movements are such a general phenomenon that it is difficult to find a precise concept to describe them. They are still considered specifically modern, that is to say a nineteenth and twentieth century phenomenon, thus excluding the peasant and slave uprisings as well as revolts by the nobility. Also normally excluded are religious movements, which have contributed to the spread of probably all major religions. The discussion is presumably determined, paradigmatically but without conceptual development, by the socialist movement in the nineteenth century. Faced with current phenomena that no longer bear this stamp, one takes refuge in the provisional concept of 'new social movements'. This phenomenon fits into no established schema; neither the description of social differentiation on the basis of strata, classes or functions nor the widespread distinction between the macrosociological and the microsociological perspective. This is not to deny that within academic sociology a corresponding specialized field of investigation has developed with its specialized literature, which in turn has needed and bred its own specialists. But the lack of theoretical and above all social theoretical perspective is all the more striking.

We will not elaborate to any great extent on the problems touched upon, and will be satisfied with a more narrow concept of the protest movement. It covers broad areas of the phenomenon of the social movement, but can more easily be delimited. Protests are communications addressed *to others* calling on *their* sense of responsibility. They criticize practices or states of affairs without offering to take the place of those whose job it is to ensure order. It is not a question of changing places, not of political opposition that would like to take over the government responsibility itself and which for this reason (it then has to do so and to be capable of doing so!) is disciplined from the outset.

It is rather an expression of dissatisfaction; a demonstration of hurts and disadvantages suffered, not infrequently of wishful thinking. There might be good or even excellent reasons for it, and just as glaring defects on the other side. But the form of protest remains a form that presupposes the other side that is to react to the protest. The collapse of this difference entails the collapse of the protest. For a moment it might appear that society is protesting against itself. But this would be an unstable, paradoxical state; and even if it is immediately afterwards described as 'revolution', one is already well on the way back to normal conditions and to new protest.

A protest, we have contended, is a communication – and for the time being no more than that. It can be expressed in a letter to the editor, or it can exploit some other institutionalized opening. It can make use of purely parasitical forms of expression, i.e., utilize in communicating the very institutions to which it is taking exception.[1] The protest then remains an ephemeral event within another system. We will speak of protest *movements* only if the protest serves as catalyst in the formation of a system of its own. Protest then, as it were, recruits its own supporters. How it all really started is difficult to establish afterwards, but the system can if necessary recount a founding myth, preserve the memory of the heroes of the founding years, commemorate the occasion, and then frequently deplore the present comparative loss of commitment and lack of willingness to make sacrifices.

In this sense protest movements can be described as autopoietic systems.[2] The protest is the form, the topic is the content, and the two

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1 See the analysis of the 'salon philosophers' by (Simon-Nicolas-Henri) Linguet, *Le fanatisme des philosophes* (London, Abbeville, 1764). For our century we would think rather of protest by university professors with tenure.

2 For social movements in general: Heinrich Ahlemeyer, 'Was ist eine soziale Bewegung? Zur Distinktion und Einheit eines sozialen Phänomens.' *Zeitschrift für Soziologie* 18 (1989), pp. 175-191. The contribution is based on an unpublished habilitation thesis (University of Münster, Germany). On the self-referential closure especially of the new social movements see also Klaus P. Japp, 'Kollektive Akteure als soziale Systeme?' in Hans-Jürgen Unverferth, ed., *System und Selbstproduktion:*

of them together set off a process of reproducing related communication, thus permitting the system to distinguish between relevant and irrelevant activities. 'Autopoietic' also means that the formation and structuring of the system is not the effect of external factors. Protest is not content that is imported into the system from the environment; it is a construct of the system itself, the grounds for which are then assigned to the environment. This does not mean that the protest cannot have comprehensible grounds, and in particular grounds comprehensible to the individual.[3] The movement is far from living only by self-deception. The system, to vary a well-known formula, is open with regard to topic and occasion, but closed in relation to the form of protest. It recognizes itself in the process by which all facts accessible to it are pressed into the form of protest and reproduced with the aid of this form. In this way it combines in every operation external reference and self-reference, i.e., external occasions for an internally updated protest.

If it is to generate and hold together a protest movement, protest must select a specific topic and stay with it. In contrast to the socialist movement of the nineteenth century, the new social movements determine their goals not on the basis of social criticism made specific in the object protested, but by using their topic to discover what is to be criticized in society. Only in a very rudimentary sense does an autonomous semantics develop, cultivating and attempting to impose deviant linguistic usage – as in the neonature semantics of the ecological movement.[4] Thus the gap between the linguistic usage of function

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Zur Erschließung eines neuen Paradigmas in den Sozialwissenschaften (Frankfurt, 1986), pp. 166-191.

3 See Wilfried von Bredow and Rudolf H. Brocke, *Krise und Protest: Ursprünge und Elemente der Friedensbewegung in Westeuropa* (Opladen, 1987). However, the question remains whether to retrace the reasons perceived by the protest movement and on the basis of which it explains itself is to provide an adequate sociological explanation.

4 What is striking in this connection is that their nature concept deviates from what physics, once the competent authority, could formulate. A physicist could never conceive of technically triggered disasters, environmental pollution etc. being forced on nature from outside. After all, they must at any rate be physically and chemically possible. On the whole the natural sciences now paint an emotionally not very attractive picture of

systems and the more close-to-home semantics of the protest movement becomes so wide that communication has to be guided by subjects at more concrete levels.[5] This renders protest movements all the more dependent on topics of their own choice.[6] But topics have a dynamic of their own, which does not necessarily fulfil this condition. They can escape the grasp of the movements; indeed, they can be taken out of their hands. In this respect we must take into consideration a very deep-seated logic in the repetition of communication. On the one hand it demands a condensation of the topic. It must – not when first introduced, but when repeated – be recognizably the same. Moreover, the topic must lend itself to confirmation in ever new situations, it must retain its relevance, must be generalized, and must be enriched with meaning rich in reference. It incorporates social relations, experience with friends and enemies, and history. But this means that aging topics can be seen in different ways and can lose in organizational strength. A revolt is exploited for the ends of a religious movement, a religious movement for political ends, to cite the early sixteenth century. With the advent of the printing press, all this becomes simultaneously apparent, and it appears obvious that the protest movement must split to readjust the relation between the topic and supporters.

Protest movements are and remain dependent on the maintenance of differences. If they are successful, the difference between topic and protest has to be withdrawn. If they are unsuccessful, they are in danger of losing participants or at least of failing to recruit new ones. Their capacity to 'mobilize resources' (an important descriptive trait in the theory of social movements) will deteriorate. Under these circumstances no more than temporary system formation is to be expected. The movement cannot be pressed into the form of a normal organization. Its autocatalysis demands protest as a form that cannot

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nature, thus giving the ecological movement the opportunity to occupy the abandoned semantic territory.

5 The evasive, similarly unspecific talk of 'ethics' represents a further aspect of this difficulty of communication

6 See Klaus P. Japp, 'Neue soziale Bewegungen und die Kontinuität der Moderne.' In Johannes Berger, ed., 'Die Moderne – Kontinuitäten und Zäsuren.' *Soziale Welt*, Sonderband 4 (Göttingen), pp. 311-333.

be pressed into the quite different form of a goal; for protesting cannot very well be declared to be the goal of the movement. Topics and also participants abandon the system, and the topics are taken more and more into consideration by the environment; they gain their place on the normal political agenda. Participants seek permanent employment in organizations. With the help of the movement they build a career – or as individuals with a permanent willingness to protest they espouse other topics and other movements. As the sediment of extinct social movements, we find on the one hand organized, decision-making structures of responsibility defined in terms of permanent staffing, and on the other hand a potential for protest – and in a mediating role as it were, a nostalgia for the civic virtue of public man.[7]

II.

In view of the wealth of possible topics for protest and in view of the situation dependence of any successful coupling of topic and protest, it is likely to be difficult to establish on the basis of topic an overview, let alone a powerful typology, of protest movements. Instead, we shall attempt to proceed on the basis of the problem presented by the social costs of time binding, on which we have touched. It will in any case be a permanent source of potential protest that every determination of a specific future has an effect of social discrimination; that is to say, it does not benefit or disadvantage everyone to the same degree. At the same time this relational problem is formulated in such general terms that it does not alone suffice to explain the occurrence of protest movements. We must therefore always take historical situations and opportunities into account, which serve as the external trigger for the self-actuation of protest movements.

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7 See among others Richard Sennet, *The Fall of Public Man* (New York, 1979); Alasdair MacIntyre, *After Virtue, a Study in Moral Theory* (London, 1981), or with historical reminiscence John G. A. Pocock, *The Machiavellian Moment: Florentine Political Thought and the Atlantic Republican Tradition* (Princeton, 1975); Istvan Hont and Michael Ignatieff, eds., *Wealth and Virtue: The Shaping of Political Economy in the Scottish Enlightenment* (Cambridge, England, 1983).

In traditional societies many uprisings, revolts, and resistance movements can be traced back to conflicts that are kindled by normative expectations. Without a clear distinction between law and morality, the question is one of right and wrong. The stratum of agricultural labourers and small farmers expects the land owners to secure their livelihood at a – however defined – traditionally determined level. Changes very rapidly develop into a threat to subsistence. Claims to protection and assistance are then self-evident, regardless of the concrete causes for the problem becoming acute – such as bad harvests, wars or the advance of the money economy. More recent literature refers to this syndrome as 'moral economy'.[8] What is decisive from our point of view is that the scope of normative binding is and remains controversial.

However, this is only one side of the coin. The same problem arises within the dominant strata . Especially in Europe, the nobility claimed the right to decide themselves questions of right and wrong. The precondition was the comparatively dense permeation of all aspects of life by the legal norm as instigated by Roman civil law, prevalent both in feudal and in canon law as well as under urban conditions of life. This made it relatively easy to establish or also simply to allege breaches of the law. The rulers were by no means excepted; indeed, society itself was understood to be a legal institution, with a consequent recognition of a right of resistance to usurpation or the unlawful exercise of power arose. A prince who acted unlawfully was, in contemporary eyes, no prince but a tyrant. He was not exercising his function of *jurisdictio* (for how could this be done unlawfully?) and thus forfeited any claim to obedience.

Even if one did speak of a right of the people to resist, the only 'people' in question were the nobles, and, since the late Middle Ages, office holders of other types – above all representatives of corporations. Within the framework of a stratified society, only small sections of the populace could act in the capacity of *populus*, of *cives*, of *subdi-*

8 See E. P. Thompson, 'The Moral Economy of the English Crowd in the 18th century.' *Past and Present* 50 (1971), pp. 76-136. See also James C. Scott, *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia* (New York Haven, Conn., 1976).

tos; and they were people who had something to lose and were therefore disciplined.

The semantics of this right of resistance included a legal concept providing law with a religious and moral basis; thus a concept of law developed that was fundamentally attuned not to the making of law, not to will and consent, but to the possibility of recognition and error.[9] We could say that the negative side of the self-referentiality of law culminated in the right of resistance. For the claim to the obedience of others had itself to be grounded in law, and this was possible only if what was demanded was lawfully demanded.

The grounding of normative judgements in a recognizable order subtracted from arbitrariness failed already during the religious civil wars of the sixteenth and seventeenth centuries, after the explosive advent of printing had demonstrated the heterogeneity of possible norms and grounds.[10] The only solution to the problem, where arbitrariness confronted arbitrariness, appeared to be in focussing this arbitrariness on one point: on the sovereignty of the monarch. Henceforth the semantics of divine right and natural law faded to empty legitimation phrases, while new concepts had to take over the task of actually delimiting real state practice, for example, the rise of the purely positive legal notion of the *loix fondamentales* in the final decades of the seventeenth century.[11] These, it is assumed, vest authority in them-

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9 See, for example, (despite an already sovereignty-related theory of the prince) Jacobus Omphalius, *De officio et potestate Principis in Republica bene ac sancte gerenda, libri duo* (Basle, 1550), p. 21: 'non semper malum est, referente Augustino, non obedire Principis praecepto, cum is iubeat ea quae Deo contraria sunt, quibus sane parendis nemo ulla divina, vel humana, vel naturali lege constringitur'. We note that this was written during the spread of the religious civil wars. On the context see also Quentin Skinner, *The Foundations of Modern Political Thought*, Vol. 2, *The Age of Reformation* (Cambridge, England, 1978).

10 Brilliantly treated by Herschel Baker, *The Wars of Truth: Studies in the Decay of Christian Humanism in the Earlier Seventeenth Century* (Cambridge, Mass., 1952, reprint Gloucester, Mass., 1969).

11 On the history of term and concept see Heinz Mohnhaupt, 'Die Lehre von der "lex fundamentalis" und die Hausgesetzgebung europäischer Dynastien.' In Johannes Kunisch, ed., *Der dynastische Fürstenstaat: Zur Bedeutung von Sukzessionsordnungen für die Entstehung des frühmodernen*

selves, since a sovereign that disregards them undermines his own rule. They are thus compatible with a prohibition of all resistance against established law. This does no more than shift the problem from 'unlawfulness' to 'unconstitutionality' as a lexical signal for triggering resistance. The word 'unconstitutional' first makes its appearance in relation to Parliament at Westminster (i.e., the sovereign) being corrupted by Crown money.[12] It then comes into widespread use in the forefront of the American independence movement, the last large-scale protest movement actuated strictly by legal questions.[13] Since then, the problem has – at least in functioning democracies – been defused by political influence on legislation, political opposition with the prospect of a change in government, and the jurisdiction of constitutional courts. The old law-based practice of resistance now seems, as Friedrich Schlegel remarks, to take the novel form of 'uneigennütziges Verbrechen' ('disinterested offence'), while representative constitutions present themselves as 'fixierte Unruhe' ('established unrest')[14] A protest against normative binding *per se* can then only be posited for the typical nineteenth century form of 'anarchism'. And if today there is still the indifferent regulatory offence of the intelligentsia's 'civil disobedience', it exists under the protection of these institutions and as a mode of expression for other protest movements that are not primarily orientated towards law.[15]

Staates (Berlin, 1982), pp. 3-33; Harro Höpfl, 'Fundamental Law and the Constitution in Sixteenth-Century France.' In Roman Schnur, ed., *Die Rolle der Juristen bei der Entstehung des modernen Staates* (Berlin, 1986), pp. 327-356.

12 See Henry Viscount Bolingbroke, 'A Dissertation upon Parties' (1735), quoted from *The Works of Lord Bolingbroke* (Philadelphia, 1841, reprint Farnborough, Hants, 1969), Vol. II, pp. 5-172 (pp. 11, 118).

13 See Gerald Stourzh, 'Vom Widerstandsrecht zur Verfassungsgerichtsbarkeit: Zum Problem der Verfassungswidrigkeit im 18. Jahrhundert.' In Gerald Stourzh, ed., *Wege zur Grundrechtsdemokratie: Studien zur Begriffs- und Institutionengeschichte des liberalen Verfassungsstaats* (Vienna, 1989), pp. 37-74.

14 Thus in 'Signatur des Zeitalters..' Quoted from Friedrich Schlegel, *Dichtungen und Aufsätze* (ed. Wolfdietrich Rasch) (Munich, 1984), pp. 593-728, Quotations pp. 598, 713.

15 It is obvious that this description does not correspond to the intention of

III.

With the protest movement of 'socialism' we arrive on historically adjacent, familiar territory, and can therefore afford to be brief.[16] Now it is no longer a matter of infringements due to norm projections restricting behavioural options, but of scarce goods being unequally distributed, of more for Tom meaning less for Dick and Harry. In the case of a conflict of norms, the infringement and thus the initiative for protest depends on who imposes his expectations in the form of law. In the case of unequal distribution it is a matter of who is successful in accumulating scarce goods or services and who has must as a result go without.

If it is a matter of scarcity, protest can now hardly be stylized as a struggle for the law, since distribution takes place not by unregulated seizure but via property and contract, that is to say in conformity with the law.[17] Since the seventeenth and eighteenth centuries, restrictions

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participants, to their desire to 'symbolize' protest. Günter Frankenberg, 'Unordnung kann sein: Versuch über Systeme, Recht und Ungehorsam.' In Axel Honneth et al., eds., *Zwischenbetrachtungen: Im Prozeß der Aufklärung: Jürgen Habermas zum 60. Geburtstag* (Frankfurt, 1988), pp. 690-712, makes the same contention, without, however, explaining why a right to symbolize can transform wrong into right.

16 On the etymology, which goes back to the 1820s, see Gabriel Deville, 'Origine des mots "socialisme" et "socialiste" et de certains autres.' *La Révolution Française* 54 (1908), pp. 385-401; Arthur E. Bestor, 'The Evolution of the Socialist Vocabulary.' *Journal of the History of Ideas* 9 (1948), pp. 255-302. As soon as the socialist movement began to gain momentum, it began, however, to write its own history, and in so doing paid no attention to the introduction of the concept. It speaks of early socialists, utopian socialism, etc. as if prior to the invention of the term one had been able to describe oneself in these terms. See among others Werner Sombart, *Sozialismus und soziale Bewegung*, quoted from the 6th edn. (Jena, 1908).

17 Although *occupatio* in the sense of initial acquisition of title by taking control of goods left ownerless remains a subject of legal debate, especially in the seventeenth and eighteenth centuries, this practice is of little importance. The topic serves rather as a point of departure for discussing the origins and legitimation of property institutions per se with inequality of distribution. Cf. Niklas Luhmann, 'Am Anfang war kein Unrecht.' In

on the use of property were gradually reduced while the enforceability of contracts was expanded, until finally in the nineteenth century mere concurrence of will sufficed (which had, however, to be evidenced and could be interpreted by the courts).[18] Now the basis for claims and protests was accordingly abstracted from law (now purely positive anyway) and anchored in a general postulate of equality. However, equality meant only that inequality required legitimation and that it was no longer sufficient to justify it by reference to divine sanction.[19]

In connection with this redirection of the occasions of protest away from normative projections towards questions of scarcity, the turn of the eighteenth to the nineteenth century also witnessed a change in the concept of society. Society was now no longer a civil society – a legal institution of those participating in it as citizens – and it was certainly no longer a contract. It was now more of an economic order that grounded privilege and discrimination in the satisfaction of needs, to be exact in the attainment of maximum economic well-being. However, this reduction of society to economics was so unrealistic – if only because it disregarded politics – that it was soon superseded by a superordinate distinction, that of society and state. It was only this distinction, gaining credence around the middle of the nineteenth century[20], that provided the economic protest movement of socialism

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Niklas Luhmann, ed., *Gesellschaftsstruktur und Semantik* Vol. 3 (Frankfurt, 1989), pp. 11-64.

18 In civil law systems the problems were located rather in demolishing 'police state' restrictions on the use of property, while in common law systems they were in the deregulating contracts addressing only the future. See Dieter Grimm, *Recht und Staat in der bürgerlichen Gesellschaft* (Frankfurt, 1987), p. 165 ff.; Patrick S. Atiyah, *The Rise and Fall of Freedom of Contract* (Oxford, 1979). It was only these two taken together with the additional development of a private corporation law independent of state privilege that led to the state having increasingly to support the implementation of normative expectations *the development of which it had not controlled.*

19 Incidentally an old Aristotelean argument that contends that an order containing rich and poor, angels and stones, men and women is more perfect than one that contains only the best positions.

20 It cannot be regarded as a coincidence that the book that more than any other contributed to freeing the distinction of state and society from the

with the context it needed to take shape and to establish itself as the protest movement of the century. In the 1840s the concept of 'social movement' frees itself on the semantic level, too, from notions such as rebellion or unrest, and instead takes on the quality of purposeful opposition.[21] The social movement calling itself 'socialist' can in view of economic discrimination appeal to the state to remedy the situation. As we know, there is the alternative of Marxism, of doing it oneself. But then one must trust in an indeterminable future to decide what is to follow the protest and who well take the responsibility.

Protest against the utilization of scarce goods, like that for or against norms, has not completely disappeared. However, this type of protest, too, has lost its former central importance. This is partly due to the development of the welfare state, partly to the abolition of the free labour market, on which wages could climb and fall.[22] Equality desiderata and statistics can still be used to evidence discrimination (at present above all by and for women) and there is sporadic protest against the legal exploitation of property (letting housing stand vacant; industrial development; road construction etc.). All this is, however, marginal to the welfare state. This has to do with the fact that the freedom of ownership and contract against which the socialist movement had once taken up arms now survives almost only as premises of political conditioning, and that as a consequence hybrid forms of legally or economically motivated protest have emerged, such as 'citi-

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context of Hegelian theory, making it available for general application, namely Lorenz von Stein, *Geschichte der sozialen Bewegung in Frankreich von 1789 bis auf unsere Tage* (Leipzig, 1850), includes the concept of social movement in its title. The distinction is indeed the precondition for the phenomenon referred to as social movement being distinguishable from the innate dynamics of either the economy or a politics focussing on the state

21 See Otthein Rammstedt, *Soziale Bewegung* (Frankfurt, 1978), esp. p. 47 ff.

22 That this is in keeping with the euphemism 'social market economy', but above all with the indispensability of moonlighting in certain sectors of the economy (for instance, repairs, renovation of houses, housework) is evidence for the marginalization of the once blanket discrimination of workers. As for the rest, what we now refer to as the labour market is firmly in the grip of central price-fixing agreements.

zens initiatives', which have other political preferences they attempt to assert. The really new aspect of protest movements today is, however, not to be found in the scattered remnants of a once powerful call for legality and economic solidarity, but in a new type of protest: in the rejection of situations in which one could become the victim of the risky behaviour of others.

IV.

Within a sociology of risk, the historical surveys of the last two sections have no value in their own right. They serve only to take us deeper into the question of whether current social movements correspond to historical patterns or whether – and how – they differ. The fact that one speaks of 'new social movements' indicates conscious distance, while also pointing to a theoretical plight. The novelty of these movements is usually attributed only to a 'change in values'; that is to say it is understood as lying only in the choice of topic and at the most in the pluralisation of protests. Theoretical efforts therefore concentrate on evidencing *procedural* continuity and uniformity in relation to a multitude of topics.[23] But could it not be the case that there is a certain mathematical uniformity in the *form*, too, in which such movements express themselves? And could it not be that this question could also yield better insight into history than the mere evidencing of more or less osmotic continuities? Be that as it may, the new protest movements in their multifariousness are nurtured by the fact that protesting has meanwhile become an established form and can leap from topic to topic.[24] Individuals, accustomed to or identified

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23 This is principally based on ideas put forward by Otthein Rammstedt. The most comprehensive treatment at present available is Lothar Rolke, *Protestbewegungen in der Bundesrepublik: Eine analytische Sozialgeschichte des politischen Widerspruchs* (Opladen, 1987).

24 See also Von Bredow and Vrocke, op. cit., p. 61: 'The new social movements as movements are capable of unity and action only in a unspecific protest milieu and only in relation to topics relevant to society as a whole. On the one hand, this represents their strength. But on the other it makes

with protest as a form of expression, can accordingly seek new topics when the old ones have run their course.

Just as coding in function systems requires programmes to regulate the allocation of positive and negative values, the form of protest requires topics that specify the whys and wherefores. General forms have also proved their worth in generating topics. One can introduce the probe of inequality into society and measure the evident inequalities. One then generates distribution topics. One can also introduce the probe of external stability and measure the state of instability. One then generates the group of topics 'danger and risk', since it is an open question whether – and how – society can maintain itself in a state of instability. Both forms use utopian notions, since society can constitute a system only *qua* internal inequality (differences) and only *qua* ecological instability (differentiation). The topic-generating forms thus guarantee an infinite reservoir of topics. They guarantee society the permanent possibility of being able to describe itself by means of protest against itself. There can, however, be shifts in emphasis in the relation between these two forms, and now there is probably a clear preference for the stability/instability form. (Women are, as so often, the late-comers. Their justified demands for equality are rapidly being satisfied in comparison to the time span needed by the socialist movement. And their movement has already entered a cooling-down phase on the empirical measure of already attained permanent employment figures.)

If we accept the suggestion that questions of risks represent a form of social burden imposed by time binding quite different from questions of norms or scarcity, it can be clearly demonstrated that we are dealing with a much more drastic discontinuity. We advance the thesis that today's protest movements now adopt equality programmes only to a limited extent with the more or less bold propagation of concrete interests.[25] More typical are protest movements that, in the

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them dependent on the selection of such general topics, the public opinion standing of which contributes to determining their life-cycle.'

25 That it is in these cases a matter of interests against the background of the equality postulate is also a central problem of the semantics of such movements, especially of feminism. For interests engender counterinterests, and one has to hide the fact that one expects cooperation on the part of

sense developed in the previous chapter, play off affected involvement against decision-making. This holds for the ecological movement in the broadest sense of the term, including dangerous technologies; but it also holds for peace movements, which for many good reasons consider armaments alone – and not just war – too risky.

The fact that risk has become a new focus for protest is to be explained by the contingency arrangement that this concept names. The temporal contingencies in relation to decision and loss (both need not be!) provoke, as we have earlier contended,[26] social contingencies. They permit varying observer stances without offering a redeeming unity. It is easy to alert people to the difference and to communicate it. This starting point, which permits the differentiated emergence of participant perspectives is, however, not formulated as such but rendered invisible as a paradox, as the unity of difference. Semantic content is deployed only for the purpose of justifying or discrediting standpoints. Protest is one of the forms lending itself to this purpose. If the future has to be seen at all from the point of view of what is only probable or improbable, this means constantly reproducing differences of opinion in the present. They may be expressed in the form of desiderata such as more information, participation, dialogue, mutual adjustment, or in the form of protest.

A more exact analysis requires the drawing of three distinctions: (1) the fact that risky decisions affecting nonparticipants are made again and again (sometimes perforce, sometimes wilfully); (2) the resulting probability of protest ensuing or, under certain conditions, of a protest movement in search of an addressee (often but not always the decision-maker) emerging; and (3) the topic of the protest movement, which must give promise of organizational strength and duration. The first of these distinctions formulates a structurally determined situation, the second situation-related actuators, and the third

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those with whom one is competing. This consideration demonstrates at the same time the problematical nature and fragility of a protest movement that, while adhering to the principle of equality can no longer find its place in the social movement of socialism, thus forgoing reference to the structural problems of modern society.

26 See Chapter 1 III.

system-generating requirements without which nothing more than short-term annoyance results.

The risk/danger distinction in its particularly acute manifestation as risky behaviour and affected involvement is an indication of dependence on social structures. As we have shown above, this pertains above all to the functional differentiation of society and to the binary coding of function systems. A society thus structured generates protest-prone situations *en masse* and initiates a selection procedure to choose one of the alternatives for system building in the sense of social movements. If successful, the selection process bequeaths the further problem of whether and how a protest movement that has emerged in response to a given situation can evolve into a system (even a temporary one), i.e., can achieve relatively stable forms. A so complex form-building procedure distracts attention from constant conditions to variable ones, from the social structural conditions for the eventuality of protest movements to the occasions therefor and the conditions for continued viability. This shift in perspective is to the benefit of the protest movements. It spares them having to reflect on their own social structural conditionality. They can describe themselves entirely in terms of their subject matter, their ends, their implementation difficulties and their growing internal problems, and can consequently imagine themselves *vis-à-vis* society. Thus they protest inside society as if they were doing so from without.

The socialist movement had already had difficulties with social theory. It had developed an important theory of capitalist society – but this was only a theory relating to the other side. The best it could offer was ancillary service as a catalytic agent in the inevitable fall of capitalism. Wherever it assumed power in the state it accordingly demonstrated an inadequate cognitive basis. How socialist enterprises with overheads totalling 850% (an example from the former German Democratic Republic) were to be economically viable at all was a question not asked.

The same applies in more acute form with regard to the fragmented new social movements. They consider the states of affairs against which they protest to be scandalous without allowing for inquiry into the reasons for things being the way they are. A theory of the other side is still lacking, and this is regarded as an advantage, indeed as an inherent element of protest; for every theory-based analysis of a prob-

lem, every search for alternatives would weaken the protest movements. The alternative is oneself.

However, this criticism of the self-description of protest falls short in one important aspect, namely that of social theory. Society, like every system (and we could even say like the world) needs an internal boundary to be able to think about itself. It cannot be observed and described from without. The only possibility is that of an imaginary projection with which a self-description can claim for itself a fictitious external standpoint. In so doing it has to accept the paradox of the unity of inside and outside, and find a form that annuls this paradox, that is to say, replaces it and thus conceals it by drawing a distinction. This is precisely what is achieved by the form of protest against something that others ought to do better. Thus the decisive question is what society is embarking upon when it realizes its self-description in the form of protest against itself.

From a formal point of view, this confirms the old insights of the philosophy of the conscious subject that reflection always requires a consideration of the other, the different, the discrete, particularly as reflection *per se*.[27] From a sociological point of view, however, what is especially striking is that the form of protest shows a high degree of affinity with communication channelled via the mass media. It satisfies the rigourous selection criteria for attracting attention and reporting: novelty, conflict, local reference, intimacy with violence, and scandal. The mass presentation of heads at demonstrations 'proves' the seriousness, indeed the mortal danger of risks and seems at the same time almost to be staged for the television camera. There is the addressee of the communication, but there is also the spectator, public opinion, in which the movement is mirrored and all of whose reactions have to be taken into account. Public opinion does not, as was believed in the last phase of eighteenth century law-orientated protest, exercise the function of a judge. It guarantees and reproduces not unity but difference. Its function lies not in making visible and push-

27 The fact the modern *conceptual philosophy* was constructed on the basis of consciousness and mind makes the parallel all the more interesting. There is apparently conceptual and theoretical-technical experience that can assert itself even if does not speak of systems of consciousness, but of social systems.

ing through reasonable grounds for judgement, but, as in the case of the market, in rendering possible the observation of observers. It acts, however the individual might feel, as a mirror in which the conflict can see itself and the confirmation of its importance. Not least of all, taken up by the media, it serves in the early phases of a protest movement to test response (which does not necessarily mean possible concurrence).

The mass media in themselves have an ambivalent relation to technology, ecology, and risk. They can admire technical progress, underestimate ecological consequences, and then on particular occasions stress them with alarm.[28] This need not be due to prejudice in favour of or against industry. The media world is far too complex for that. But to a certain extent protest movements also contribute to creating topics – above all in the activist subentities such as Greenpeace, which puts to sea in little boats to war against big ships, and which with this David and Goliath spectacle alone attracts attention and sympathy. Alone the photogenic *mise-en-scène* of large-scale demonstrations, too, fulfils an important media selection criterion. The other side of the coin is the high consumption of subject matter and a lack of synchronization between the time perspectives of the protest movements and those of the mass media. The mass media ensure a rapid echo, diffusion of the topic, indeed practically a usurpation of the subject matter. They integrate the protest – partly because they need it as a supplier of information or can at least use it, and partly because even protest against the media would still require the media and the criticism would either confirm the universality of the forum or would simply not have taken place. Demonstrations follow the model given in the media (they are not invented for the nonce). Only in this manner do they become a form of visible democracy.[29] Certain patterns have become well established: middle class intelligentsia with undergraduate humour and working class aesthetics, spontaneity, and discipline, nonchalance without irresponsibility, and nevertheless a lack of

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28 A survey is provided by Malcolm Peltu, ed., *Regulating Industrial Risks: Science, Hazards and Public Protection* (London, 1985), pp. 128-148 with numerous individual case descriptions.

29 See Peter Klier, *Im Dreieck von Demokratie, Öffentlichkeit und Massenmedien* (Berlin, 1990), esp. p. 136 ff.

control over events. All this alters nothing in the temporal discrepancies, in the temporal states of emergency that arise from something always having to be happening. Perhaps the most remarkable feature of the mass media is their rapidity.[30] This has not only stylistic consequences such as brevity, changes of scene or monotony, but also leads to a rapid consumption of subject matter with the result that topics can be treated over longer periods only if standing organizations are set up in time. Only established agencies permit self-perpetuation.[31] The protest movements can then claim for themselves the historical merit of having discovered topics and of having placed them on the agenda. But they cannot survive on this alone. They have to radicalize their demands, heighten their sensibility, and attempt to attain positions that offer only limited room for consensus. Or they disperse, leaving behind a general residuum of protest potential from which, given favourable opportunities, new movements can form. As a countermeasure they develop copulative formulations making it easier to recognize very different movements as being related provided they are 'alternative', and facilitating transitions, or rather leaps from one protest topic to another. *Opposition oblige.*[32] And biographically it is also sufficient to maintain identity as a symbol circulating from protest to protest.

With these special characteristics, protesting reflection does something that is done nowhere else. It espouses subject matter that none of the function systems, neither politics nor the economy, neither religion nor education, neither science nor law would acknowledge as its own. It impugns the self-descriptions produced by reason of the primacy of functional differentiation within the function systems. Nor is

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30 See from a more general point of view the second of Italo Calvino's *Six Memos for the New Millenium*, P. Greagh, trans. (Cambridge, Mass., 1988).

31 On a relatively late cooling down phase in such a development see Richard P. Gale, 'Social Movements and the State: The Environmental Movement, Countermovement, and the Transformation of Government Agencies.' *Sociological Perspectives* 29 (1986), pp. 202-204.

32 For the rest in a politically often fatal manner, as intellectual in these movements have learned in having to attempt to preserve their independence in judging quality and their cognitive rectitude.

it dependent on a representative and binding description of this society being possible. It compensates for modern society's manifest inadequacies in reflection – not by doing it better, but rather by doing it differently. The rapid growth in attention being paid to ecological matters is due to such movements, as is the ever more urgent calling into question of faith in technology. Today we know that like it or not, we have to live without much confidence in secure prospects for the future. A society that describes itself by means of protest against itself will be able only to reconfirm this over and over again. From the point of view of the enlightenment project of the age, one could regard this as a bleak prospect.[33] Nevertheless, the sensitivity to the consequences of structural decision in modern society thus generated and the social costs of every binding of time are results that we need not necessarily regard as negative.

Evaluation can thus be either positive or negative. This alters nothing in the fact that the protest movement – as becomes apparent when it is subjected to second-order observation – is bound to the form of protest. It presupposes another side against which it can protest, and cannot itself be or become this other side without the protest and with it this specific form of societal self-observation being snuffed out. Like a watch dog it has an urgent need to restore order or at least to prevent deterioration. And like a watchdog it has a choice only between barking and biting.

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33 Thus Jürgen Habermas, 'Die Moderne – ein unvollendetes Projekt.' In Jürgen Habermas, ed., *Kleine politische Schriften I-IV* (Frankfurt, 1981), pp. 444-464, who, however, then represses the problem and diverts it into criticism of an alleged 'neoconservatism.'

Chapter 8
Demands on Politics

I.

The political system is one of the function systems of modern society, the daily operation of which requires and renders possible a high degree of risky decision making. And here, too, the growing trend towards risk taking is on the basis of binary coding

The unequivocalness of superordinate and subordinate status intrinsic to the hierarchy of office in the modern state makes it possible to take and to implement decisions even if their consequences cannot be assessed. This is particularly true of regulative politics, which affects other function systems, for example, for intervention in the economy in the shape of tax raising or borrowing, for amendments to patent law, for changes in divorce law, for education policy, for the granting and withdrawal of subsidies to scientific research, for the approval or rejection of drugs (or also just for the duration of the inspection and testing procedures), for changes in the conditions for the reimbursement of medical expenses – to name only a few instances from an endless range. The impossibility for the political system effectively to control other systems with an adequate grasp of consequences and limited risk is inversely proportional to the facility with which such decisions can put into force and, however sporadically, actually implemented. The astonishing expansion of competence in the welfare state begets a gigantic and uncontrollable machinery for increasing risk. Does anyone know what the consequences are of releasing waxed apples for consumption but not apples that do not have a minimum diameter of 55 millimetres? Only the sheer scale of ignorance and the often not very spectacular consequences prevent this risk trend from becoming a major political scandal.

The politicization threshold for topics is correspondingly low. One need only name a value that in given circumstances is only unsatisfactorily met – and in the case of risk policy this would constitute

'safety' – and a topic is born.[1] The rest is preventive work or delaying tactics. Frequently a 'right to ...' is invented to strengthen the message. Although this is a paradoxical argument – for were there such a right, political activity would not be necessary: one could turn to the courts – in political rhetoric all that counts is finding formulations that cast an unfavourable light on the opponent. Then the impression almost inevitably arises that one's contentions are tenable.

The problem is intensified by a second coding: that of government and opposition. This code constitutes a temptation to make decisions with an eye on their electoral effects. If one wishes to take no risks from this point of view it can, however, lead to greater willingness to assume risks in many other respects. From the point of view of electoral tactics it may be advisable to obstruct developments in fields such as research, technological progress, and industrial projects, without reflecting on the risks that such obstruction involves. Above all, the opposition principle rewards whoever imposes a subject matter and pushes it rapidly through to the decision making level, so that more attention is paid to catchwords and presentation than to evaluation of consequences. In all these regards an analysis of the political system confirms our contention that functional differentiation and binary coding limit the prospects for control and promote the tendency to take risks.

Whereas the old politics of the state put its faith in the *raison d'état*, and with reference to this principle justified keeping intentions and, where necessary, acts secret in the interest of attaining its ends, the inverse problem imposes itself today: acts have to be made public that possibly do not even take place, or that cannot have the effects attributed to them. One must be constantly in view and must direct one's attention to observing under what conditions and with what expectations one is observed. One must not hide intentions but announce them. As Nils Brunsson has shown for Swedish organization,[2] the system specializes in talk, i.e., in presenting efforts at rational decision making. The risk then consists in verbalism leading to expecta-

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1 Setting off chain reactions in the political system, as Eric Ashby, *Reconciling Man with the Environment* (London, 1978), has demonstrated.

2 See *The Organization of Hypocrisy. Talk, Decisions and Actions in Organizations* (Chichester, 1989).

tions being awakened that one cannot or does not want to meet. This switch from official secrecy to publicity as a medium of communication alters the risk situation, and does so in both respects: in the attention paid to risks occurring in society, and in the risk proper to politics.

The political system can observe risky behaviour and in so doing relate it to causes or structures or to statistical frequencies. Where human behaviour is identified as the cause, one can attempt to regulate such behaviour out of existence – whatever may then come to replace it. At present the observation of technology-related risks and dangers is experiencing a political boom. Since from the structural point of view technology is a simplification necessary for successful operation, and since it must for this reason disregard actual, to say nothing of possible, causalities, politics has in this field to expect permanent, constantly repeated perturbations. Seek and ye shall find! To this extent there is a structural affinity between technology and politics in the sense of a mutual reproduction context – in which politics cannot avoid approving technology and thus providing itself with a source of perturbation. The 'democratically' open, not precedently delimited repertoire of topics provides politics with one of its units of experience in relation to which it can learn, expect repetitions, develop specializations and routines of intercourse, acquire knowledge of persons and institutions, and in its organizations make available precedents, patterns for success and examples.

This is, however, only one of the aspects under which politics becomes relevant to our subject. A second has to do with our society constantly reproducing the distinction between decision makers and affected parties, and being able to offer only political solutions for the resulting conflicts. That one person's risky behaviour becomes a danger to others is, as we have shown, among the fundamental problems of modern society; increasing as more and more of the future apparently comes to depend on decisions taken in the present, and as more and more current undesirable situations are regarded as the unwanted result of past decisions or decisions omitted. The political system is exploited to an overwhelming degree by (or in the name of) those who do not participate in the making of the decision, but would be affected

by any detrimental consequences thereof.[3]. And this also points to this not being so much a matter of examining the basis on which decisions are to be made or of quantitative evaluation as of confidence. As protest movements and the mass media espouse such problems, the political system is addressed directly, and at the same time it becomes clear that the traditional agendas of legal protection and corrective redistribution no longer suffice for the purpose. This applies especially with regard to the conventional machinery of the constitutional state, to the rights of individual liberty, and to the legal self-limitation of political powers.[4] This had been conceived for other problem situations. Nor has the schema of the political party yet reacted, for the moment at any rate, to this new urgency. Names such as 'liberal' or 'socialist' continue to be brandished, having long since lost their distinguishing force and – with the plethora of ancillary topics in party platforms – hardly suitable for the purpose of offering a difference between decision makers and affected parties as an electoral option. And how could this be done?

However politics may come to be structured, the conflict between decision makers and affected parties cannot be influenced by a quantitative analysis of risky situations. It may well be possible to calculate that the danger to which one is exposed by the existence of a new nuclear power station in the neighbourhood is no greater than the risk of deciding to drive a further three miles per year.[5] The calculation is

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3 See also (on 'involuntary risks') Chauncey Starr, 'Risk Management, Assessment, and Acceptability.' In Vincent T. Covello et al. (ed.), *Uncertainty in Risk Assessment, Risk Management, and Decision Making* (New York, 1987), pp. 63-70.

4 See Dieter Grimm, 'Die Zukunft der Verfassung.' *Staatswissenschaften und Staatspraxis* 1 (1990), pp. 5-33

5 An example from Mary Douglas, *Risk Acceptability According to the Social Sciences* (New York, 1985), p. 23. For a more differentiated evaluation of the range and the subjective, i.e., also political influences on the selection and evaluation of factors in risk analysis see Paul Slovic, Baruch Fischhoff, and Sarah Lichtenstein, 'Perceived Risk: Psychological Factors, and Social Implications.' *Proceedings of the Royal Society of London* A 376 (1981), pp. 17-34; Ortwin Renn, 'Risk Analysis: Scope and Limitations.' In Harry Otway and Malcolm, eds., *Regulating Indus-*

hardly likely to impress anyone, since in the one case the problem is perceived as a disaster and not in the other; and also because the aptness of quantitative analysis to manipulation is notorious.[6] The method itself opts for the side it is using in a particular case. In fact quantitative analysis always becomes irrelevant where disasters are to be feared. What is to count as a disaster is not decided on the basis of objective criteria. For the individual, the loss of his driver's licence or access to drugs might constitute catastrophe.[7] Conceding the circularity of the argument, we shall therefore speak of disaster whenever the affected party refuses to allow himself to be convinced by quantitative analyses.[8, 9] This disaster threshold is set in very different ways by the politically relevant population and above all by the mass media, and it

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trial Risks: Science, Hazards and Public Protection (London, 1985), pp. 111-127.

6 Manipulation, of course, by both the supporters and opponents of risky decisions.

7 On the unimportance of formally exact knowledge in matters felt to be of vital importance see also Brian N. R. Baird, 'Tolerance for Environmental Health Risk: The Influence of Knowledge, Benefits, Voluntariness, and Environmental Attitudes.' *Risk Analysis* 6 (1986), pp. 425-435 (430 ff.)

8 Similarly Nicholas Rescher, *Risk: A Philosophical Introduction to the Theory of Risk Evaluation and Management* (Washington, 1983), p. 70 ff., with the important point that rich and poor have different disaster thresholds (what constitutes a disaster for one is merely a loss for the other), so that the wealthy have a better chance of being able to offset risks against opportunities than do the poor. On the social conditionality of the relevance of quantities and probabilities see also Steve Rayner and Robin Cantor, 'How Fair Is Safe Enough? The Cultural Approach to Societal Technology Choice.' *Risk Analysis* 7 (1987), pp. 3-9.

9 With regard to the decision maker himself there is a similar problem that depends on whether the decision maker's behaviour is guided by success or by the survival of his organization. Here, however, this difference has no effect on the use of quantitative methods, and the question is rather of whether survival problems that are becoming apparent anyway increase the willingness to assume risks in comparison to well-situated firms. The answer would probably depend on further distinctions, for instance whether the risk lies in the technical field or in that of organization and personnel.

will prove difficult to obtain agreement even on borderline cases – because it is precisely here that the exact delimitation of the loss falls within the zone of the uncertain. This means that politics cannot rely on the quantitative calculation of a risk and that it cannot be expected to do so. Instead it has to make do with informal guesses on the effects and above all on the acceptability *of its own decisions*.

II.

At this stage a digression is appropriate to review the myth of the 'propitious moment' for decisions. The propitious moment is the best moment, and hence the time when a decision can be made without running a risk. It is defined as a passing opportunity to do something that one intended to do anyway.[10] It not a question of spur-of-the-moment inspiration. The course of the world may well produce misfortune, but this is fate and not the consequence of a decision, which is, so to speak, legitimized by the moment chosen for making it.

The cognitive form of the propitious moment (*kairós*) played a considerable role in early European theories of politics, but also wherever *prudentia* was addressed. Its prehistory is located in ancient oriental divination systems. Cosmological (above all astrological) safeguards were an element in the syndrome. On the one hand, choosing the propitious moment was entrusted to intuition, but was also subject to rational decision making. Neither too early nor too late, now or never – this pattern of thinking was applied in an effort to cope with risky situations. And *Fortuna* had to help, but could also refuse or only pretend to do so.[11] She appeared only in close association with *Virtus*, aiding and encouraging the diligent. Closely related thereto we find warnings against carelessness and foolhardiness, against a demonstrative use of courage and force incommensurate with the situation.

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10 See, for example, Ch. B. Bessel, *Schmiede deß Politischen Glüks* (Frankfurt, 1673), p. 243 ff.

11 See Rudolf Wittkower, ed., 'Gelegenheit, Zeit und Tugend.' (1937/38), in Rudolf Wittkower, *Allegorie und der Wandel der Symbole in Antike und Renaissance* (German edition Cologne, 1984), pp. 186-206; Klaus Reichert, *Fortuna oder die Beständigkeit des Wechsels* (Frankfurt, 1985).

This cognitive form still retains a certain plausibility.[12] The propitious moment for a political decision on the abolition of nuclear power stations lay in the days following Chernobyl – neither before not after. The propitious moment for advancing German reunification lay immediately after the opening of the borders, and only at this point in time was it possible to disregard the economic risks involved. The propitious moment for the Austrian ultimatum to Serbia in 1914 was in the days following the assassination of the Austrian heir apparent in Sarajevo. Only at this moment could one assess the risks of war. The actual ultimatum came much too late and could thus only be understood as a provocation and as the conscious acceptance of the risk. The assumption that choosing the propitious moment averts risk has nowadays nevertheless lost all justification. It is still possible to say that any attempt to decide rationally takes time, and thus entails the risk of letting favourable opportunities go by or of missing the last chance to prevent inevitable developments.[13] No one believes any longer that time itself designates favourable points in time. And when the spouse of an American president seeks astrological advice, this is noted with astonishment and displeasure by all. The choice of a propitious moment for a risky decision has itself become a risky decision.

This obsolescence certainly has something to do with the expansion and intensification of the problem of risk, but also with the more pronounced differentiation of the temporal and material dimensions in the modern age. Time *per se* no longer functions as the representative of the objective complexity of the moment. This complexity has to be determined and reduced as such. Moreover, the semantics of the propitious moment is incompatible with democratization. For what constitutes a favourable point in time for the government of the moment

12 I am reminded of a conversation with Paolo Fabri.

13 See Klaus Peter Japp, 'Das Risiko der Rationalität für technisch-ökologische Systeme.' In Jost Halfmann and Klaus Peter Japp, eds., *Riskante Entscheidungen und Katastrophenpotentiale: Elemente einer soziologischen Risikoforschung* (Opladen, 1990), pp. 34-60. Following Nils Brunsson, Japp counters this – as it were – rational rationality with a more forceful and more strongly motived 'impressionistic rationality'. But this brings us back to the question of locating the kernel rationality – what these two rationalities have in common.

would for this very reason be disadvantageous for the opposition. The rules of the political game involve winning or losing time in the run-up to the next election. Politics operating under present day conditions is therefore unlikely to be given the chance to evade its own risks by choosing the propitious moment, let alone the opportunity to reduce the risk burden of society in this way. This does not mean that the time chosen for making decisions is of no significance; but the choice is now only one element in the general risk of determining a decision.

III.

These considerations reduce the hope for a secret political recipe for transforming social risks into political ones, so that they can be eliminated or at least reduced by political means. This also implies that the situational discrepancy between the people making the decisions and those affected by them continues to weigh on the political system with unaltered force. Not even a general political form is discernible that could construct the relationship between the decision maker and the affected party (as had been achieved in the constitutional state by coupling the political and the legal systems by means of the constitution[14]). For this very reason, ways are being sought to defuse the situation below the political level and, even where consensus is lacking, to involve the political machinery of the state with its competence for collectively binding decisions only as a last resort. Absorption strategies fulfilling this (often only latent) function bear labels such as participation, information/communication, and ethics.

The semantics of 'participation' is in the first place ideological in appeal, providing a certain self-satisfaction in demanding participation, thus placing the opposing side in a position where it cannot reject the demand, or can do so only with difficulty or excuses. From a political point of view it is above all a weapon, an instrument for forcing the political opponent to justify himself. However, this analysis remains at the level of political rhetoric. If we look more closely at systemic practice, we will find that the legal system, in characterizing

14 See Niklas Luhmann, 'Verfassung als evolutionäre Errungenschaft.' *Rechtshistorisches Journal* 9 (1990), pp. 176-220.

a question as 'political', is largely abstaining from examining substantive aspects, concerning itself rather with adjective implications.[15] On this basis it is an obvious political step to make use of this disposition of the legal system, and to demand and obtain participation for affected parties.[16] But what is achieved?

If the problem consists in a structurally reproduced discrepancy between decision makers and affected parties, the recipe of participation amounts to denying the problem, or at best to gaining time by postponing a solution.[17] However, can one expect participants in such events to be satisfied other than by seeing decision made in accordance with their wishes? Breaking down complex decisions into partial decisions may be useful. It could provide each side with opportunities to attain its goals. To this extent participation contributes to a process of bureaucratization. It will presumably also retrace and reinforce the boundary line between internal and external communication in relation to the political system. Decisions negotiated in the process of participation have to be explained externally as 'feasible to all intents and purposes'. This does nothing, however, to change the politically relevant difference between decision makers and affected parties. It is a precondition for all organizational effort. The risk taken by the decision maker and the danger run by the affected party diverge. One man's risk is another man's danger. Participation by those affected in the decision making process could confront them with the

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15 See, for example, the Buschhaus (power station) decision by the Lüneburg Higher Administrative Court of 28th Feb.1985, *Neue Zeitschrift für Verwaltungsrecht* 4 (1985), pp. 357-359.

16 This is clearly demonstrated by the discussion on limiting values. See, for example, Barbara Zeschmar-Lahl, 'Wie wissenschaftlich ist die Toxologie? Zur Problematik der Grenzwertfindung.' *Zeitschrift für Umweltpolitik und Umweltrecht* 10 (1987), pp. 43-64.

17 For a similarly rather sceptical evaluation of experience hitherto with participation see Dorothy Nelkin and Michael Pollak, 'Public Participation in Technological Decisions: Reality or Grand Illusion?.' *Technology Review* (Aug./Sept. 1979), pp. 55-64, and Michael Polak, 'Public Participation.' In: Harry Otway and Malcolm Peltu, eds., *Regulating Industrial Risks: Science, Hazards and Public Protection* (London, 1985), pp. 76-93. Experience accumulated since is unlikely to modify this evaluation.

inevitability of risk. This could result in a different consequence mix of known and unknown, certain and uncertain advantages and disadvantages. If this shifts the risk, recourse to participation would have to be repeated. Now the new set of endangered parties would have the floor – such as the doctors' widows who depend on a regular income from investments; or research scientists who could lose their jobs; or the inhabitants of tower blocks who would be in danger of being trapped in elevators if the power supply is unreliable. There are no limits to stepping up participation; or at most, only practical limits in that only affected parties capable of organization are to be included. It could be regarded as a public officials' ideology.

What counts, however, for the political system is only organized communication. Organizations communicate with organizations. This is the only way collective entities can achieve communication on behalf of larger circles of affected parties.[18] All that matters otherwise is avoiding scandal. In this limited sense the political system can indeed make use of participation to transform protest into paragraphs. On this level 'gag rules' can also become routine,[19] i.e., reaching an understanding on not broaching insoluble problems that cannot be solved in this manner – such as questions on the legitimation of officials or the avoidance of drastic measures in respect of their clientele. This forms the basis of 'neocorporatism'. It should not be underestimated politically, even if we must ask if this suffices to appease affected parties who actually consider themselves in danger.

Within whatever limits, participation works only as communication; but the postulate of comprehensively informing the public on risks and dangers goes far beyond this. One may cherish the hope of gaining confidence by providing honest and complete information. But why is confidence needed if nothing is concealed? Presumably the desire to be better informed is more an indication of having lost confidence than a means to gain it.[20] In another regard, too, there is

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18 See p. ...

19 On the corresponding functional conditions of the constitutional state see Stephan Holmes, 'Gag Rules or the Politics of Omission.' In Jon Elster and Rune Slagstadt, eds., *Constitutionalism and Democracy* (Cambridge, England, 1988), pp. 19-58.

20 On the state of the discussion see: Ortwin Renn and Debra Levine, 'Trust

remarkable ambivalence. A communication, if understood, always provides the opportunity for accepting or rejecting the content offered. Why should more communication incline the addressee to accept what he is offered rather than to reject it? One would have to be able to communicate the truth and honesty of the communication. As we have long since recognized, however, this is impossible. What is likely in such circumstances is that the communication will reinforce an existing disposition. If the affected party thus assesses probabilities, extent of damage etc. differently from the decision maker, communication will do nothing to change this. The most that could be expected would be the elimination of sheer errors; but in the highly complex interplay of cause and effect this will seldom influence attitudes towards decisions. One mistrusts the thorium reactor even if one knows and accepts the physical reasons for describing it as safe.

Forced communication in such circumstances becomes involved in paradox.[21] It engenders suspicion against the person making the effort. Not least of all it would require information on all the uncertainties experienced by the decision maker, and would then necessarily itself provide grounds for doubt and resistance. For not knowing enough is typical of risky situations. A quite different question is that one should not deny information that has been requested, for this must perforce nurture exaggerated alarm. The fact that one can do many things the wrong way is no guarantee that one can also do them the right way.

This situation confronts politics with a presentation problem. Politics has insufficient universal knowledge; above all, it has no knowledge of the future. It must therefore make risky decisions. However, in the politicized conflict between decision makers and affected parties it cannot very well present its decisions for what they are – risky. Precisely in this situation, a propensity for decision making is not a suitable recipe. Politics has to choose other forms for presenting itself. We have already pointed out that talk is its speciality. One possibility would be rational decision making: seeking out the alternatives,

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and Credibility in Risk Communication.' In Helmut Jungermann et al., eds., *Risk Communication* (Jülich, 1988), pp. 51-81

21 See Harry Otway and Brian Wynne, 'Risk Communication: Paradigm and Paradoxes.' *Risk Analysis* 9 (1989), pp. 141-145.

weighing them, and then selecting the most appropriate. But it is no secret that one cannot decide in this fashion, and whatever the political process conceals, it remains transparent enough to condemn any such presentation to failure. There are too many 'rationally founded' criteria for making other decisions. One is faced with the necessity of restricting efforts to obtain information for lack of time and money. One has to depend on a willingness to cooperate that must not be discouraged by rational investigation. Moreover, it is true particularly in the field of politics that what may be rational when done by a few may no longer be rational when done by many; so that collectively binding decision making undermines its own action theory premises. It has to learn from unanticipated secondary effects of its own generalizations, *after* having determined them.[22] Moreover every decision is only an event that has to be assigned a certain point in time, while the next moment can provide grounds for a different evaluation – precisely because the decision can then be determined on the basis of observable factors. Rationalization engenders time pressure whether intentionally or unintentionally. Time pressure changes the demands made of rationality and finally leads to 'impressionistic' decisions, or to decisions that can in all cases be rationalized after the event by arguing the pressure of time[23] – here, too, either intentionally or unintentionally. One then very typically negotiates a political agreement on decisions provoking the least expenditure in coordination: pecuniary settlements.

If, however, the two forms of presenting politics that would seem most obvious, namely the 'courage to decide' and 'rationality' are ruled out, what communication options are still available? Perhaps a careful differentiation between the decision itself and the communication thereof or a hedged-about intentional vagueness in both regards?

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22 This is a typical argument in system and evolution theory analyses. See, for example, Louis Boon, 'Variation and Selection: Scientific Progress without Rationality.' In Werner Callebaut and Rik Pinxten, eds., *Evolutionary Epistemology: A Multiparadigm Program* (Dordrecht, 1987), pp. 19-177.

23 See Klaus P. Japp, ed., *Riskante Entscheidungen und Katastrophenpotentiale: Element einer soziologischen Risikoforschung* (Opladen, 1990), pp. 34-60.

Can the politician who – to the horror of press and intelligentsia – presents himself as simple-minded be regarded as attractive? Or perhaps the politician with the highest entertainment ratings?

This sceptical evaluation of framework conditions need not exclude a 'dialogue on risk'.[24] On the contrary, it makes it clear that rather improbable conditions have to be met (but are capable of being met) if successful cooperation is to come about. These include acknowledging risk as the basis for dialogue.[25] On the one hand the notion of 'practically sufficient security' (catchword 'residual risk') has to be abandoned. And on the other, one has to be able to consider living with risk. In other words both sides have to give up perceiving the problem in the risk/security schema. If they do not do so, there will be inevitable divergence on the question of whether the degree of security attained is sufficient or not. One has similarly to renounce the notion (even if only via the hypothetical assumption of the opposite) that it is possible to decide correctly at any specific point in time. Instead there would have to be a continuous revision of position in relation to risk – the circumstance that one is assuming the risk becoming the most important source of information. Instead of naïvely trusting in the strength of his own arguments or even in the apparent evidential force of facts themselves, the decision maker can trust only to the 'self-constraint of his partner in discourse'[26] and attempt to retain sufficient options himself for a change in premises.

Whereas the preliminary strategies we have dealt with so far have put their money on communication, that is to say on operations within

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24 On this concept (principally developed in St. Gallen) from the viewpoint of risk management in the enterprise see Matthias Haller, 'Risikodialog.' In Roswita Königwieser and Christian Lutz, eds., *Das systemisch evolutionäre Management* (Vienna, 1990), pp. 322-341.

25 This is also the argument in Karl-Heinz Ladeur, 'Die Akzeptanz von Ungewissheit – Ein Schritt auf dem Weg zu einem "ökologischen" Rechtskonzept.' In Rüdiger Voigt, ed., *Recht als Instrument der Politik* (Opladen, 1986), pp. 60-85 (78).

26 As formulated by Josef Esser, *Juristisches Argumentieren im Wandel des Rechtsfindungskonzeptes unseres Jahrhunderts* (Heidelberg, 1979), p. 18. Esser's text can be recommended as required reading before entering any risk dialogue, as he decisively switches legal argumentation theory away from the search for truth towards the assertion of rights.

the context of institutional normal forms, the term 'ethics' refers rather to hopes that are guided by rules and their moral enforcement. For more than two decades ethics has been increasingly the subject of debate, and consistently so in connection with risk. The trend is against the putative ruthless exploitation of opportunities and, on a very superficial level, is inspired by the notion of an opposition between egoism and altruism. Wherever a weak spot in society is suspected, ethics are called for – be it in research, in economics, in medicine, or in politics. Whoever supports ethics can count on the goodwill of others; whoever invests in ethical funds can earn good money with a good conscience.[27] Couched in rhetorical terms, he occupies a position that can be attacked only at the cost of losing either one's stake or face (or at best at the cost of a practically superhuman effort of analysis).

Even a superficial overview must reveal that contact to the subject matter that in the academic tradition had been dealt with under the heading of 'ethics' has been lost. No notice is taken of the fact that the opposition of egoism and altruism had already been abandoned in the eighteenth century; nor are the specific theoretical problems taken into account – let alone solved in a novel manner – that have become apparent in the mainstream of transcendental-philosophical and utilitarian ethics since the end of the eighteenth century; for example, the deductive unproductivity of Kantian moral law or the unhelpfulness of material value ethics in solving value conflicts (lacking transitivity of value systems), the logical problems arising from the aggregation of individual preferences into social ones, or the differentiation between the benefits of action and those of rules. On all fronts serious discussion has become bogged down in distinctions. The reaction to this situation outside the inner circle of academic debate[28] is to breach

27 'Ethik-Fonds: Gutes Geld mit gutem Gewissen verdienen.' is the headline given by Wolfram Weimar to a report in the *Frankfurter Allgemeine Zeitung* of 13th February 1990, p. 25.

28 Within the academic debate not infrequently by putting aside modern ethical problems and returning to the ethos-ethics of Aristotle, who had indeed presupposed that ethical virtue become *directly* effective in the form of politics. The sociologist need make no comment on an anachronism of this type.

the traditional context and – as a publicity-effective – novelty to call for ethics. Ethics serve as a form of reaction in problem situations, backed by undeniably good intentions. However, 'The professionals themselves show a remarkable degree of reluctance.'[29]

Statements referring directly to the ethics of risk confirm this scepticism. They tend to contradict the problem rather than to offer a solution deserving the moral predicate 'good'. Responsible conduct is recommended. But how to go about it when the problem consists precisely in the fact that consequences cannot be anticipated?[30] Or one adopts the maxim that one may behave in a risky manner as long as others are not affected[31]; but this only settles a case that does not exist or that at any rate does not exist to the extent that one sees the problem as lying in the social costs of time-binding.[32]

It is not misguided to regard the simple fact of trusting to ethics (and this is quite clearly a fact) as a symptom for something else.

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29 As is remarked by Dieter Simon, 'Zukunft und Selbstverständnis der Geisteswissenschaften.' *Rechtshistorisches Journal* 8 (1989), pp. 209-230 (224), especially with reference to the discussion on ethics.

30 It is an old topos of aristocratic ethics, which also counts in this context, that reckless, irresponsible conduct can be morally condemned (even when successful). All that is lacking is the form, that is to say the marking of the boundary between reckless and responsible. Today, too, we lack social conventions facilitating the drawing of such boundaries.

31 Thus, in the conviction that he is able to make a contribution to the subject, Nicholas Rescher, *Risk: A Philosophical Introduction to the Theory of Risk Evaluation and Management* (Washington, 1983), p. 61: 'Morally speaking, an agent is only entitled to 'run a calculated risk' *on his own account* but not for others'.

32 Before the topic of risk became acute there had already been a similar debate. The subject under discussion was, on the occasion of homosexual conduct between consenting adults having been legalized, whether all conduct has to be accepted that does not interfere with the rights of others; or whether morality itself represented sufficient grounds for intervening by means of legal regulation. See Patrick Devlin, *The Enforcement of Morals* (London, 1965), and H. L. A. Hart, *Law, Liberty, and Morality* (London, 1963). The scope of this controversy remained limited, however, although the energy expended on the discussion shows to what extent the problem affects general notions about law, politics and societal order.

Observation more closely concerned with the matter itself could also be helpful. The debate on ethics itself, beyond all conflict within the range of the transcendental, value ethics, and utilitarian branches, has at least established one thing: a dependence on additional decisions not determined by rules or maxims or value patterns, but which have to be added.[33]. Ethics cannot of itself overcome this built-in hiatus. It does not, as in the Aristotelean context, provide insight into good and bad goals, but only the insight that one needs further decisions to be able to communicate on an ethical basis with a claim to morality. Politics, expecting ethics to help it make decisions, is referred back to itself; and for all practical purposes it is referred to organizations that are in a position to formulate resolutions, take votes, and communicate the results. The political commission is preceded by the ethical one. The fact that only pseudocompetence in ethical matters is on offer does not mean that, following the logic specific to the political system, nothing can be done with it.

IV.

For both structural and semantic reasons, the political system is today pressured into politicizing risks of whatever provenance, whether industrial emissions or Aids, reckless driving or over-tired bus or truck drivers, genetically manipulated and reproducible forms of life, or the risk of becoming an invalid, where this has hitherto not been covered by health insurance. And what do holiday resorts do when the tourists stop coming, or farmers when they cannot sell their produce at market prices? They turn to the politicians for help as soon as the problem has reached proportions that appear so great that personal precautions against risk are not effective. We can search in vain for a limited catalogue of functions of the state or for limits to state activity determined by nature or society: the politicization of problems is the concern of politics. The political system is a self-referentially closed sys-

33 See Wolfgang Kluxen, 'Moralische Aspekte der Energie- und Umweltfrage.' *Handbuch der christlichen Ethik*, Vol. 3 (Freiburg im Breisgau, 1982), pp. 379-424.

tem, and whatever it declares to be political is thereby political.[34] And it is precisely this closed nature of the system that sensitizes it to all possible demands however exacting. Thus politics finds itself exposed to and defenceless against the demand that it take preventive action. The logic of the argument is convincing: it is better to prevent losses from happening in the first place than to remedy them once they have occurred. However, prevention if taken seriously can hardly be reconciled with social differentiation, since it would require the deployment of means interfering drastically in other functional domains.[35]

Self-referential closure does not mean that the political system could do or abstain from doing what it chooses. What is meant is that the system can only define what is to be categorized and followed through as political by means of its own (i.e., political) operations. The 'arbitrary' element in the definition of sovereignty had been formulated in accordance with the blueprint of will and action. But the political system cannot act; it is not a collective actor.[36] It can naturally be described as an action system, but this means only that it consists of actions, not that it can act as a unit. The collective attribution of action requires organization. Although the political system contains a decision making and active entity organized in the form of the state (Heller), politics is much more than the activity of the state. All communication addressing state entities is by this fact alone political communication. Politics is all political parties and every sort of political lobby; all information in the press, on the radio, or television that is

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34 See Niklas Luhmann, *Political Theory in the Welfare State* (Berlin, New York, 1990; German edition 1981).

35 The committed demand for preventive policies that is itself satisfied with ethical justification appears correspondingly naive. See, for example, Bernhard Glaeser, *Umweltpolitik zwischen Reparatur und Vorbeugung: Eine Einführung am Beispiel der Bundesrepublik im internationalen Kontext* (Opladen, 1989), esp. p. 126 ff.

36 The difficulties that result for political science are at present apparently bridged by the concept of institution, to which one can attribute power, impotence and all sorts of effects. See as theme of the *17. Wissenschaftlichen Kongresses der Deutschen Vereinigung für politische Wissenschaft* (1988): 'Macht und Ohnmacht politischer Institutionen' and the corresponding volume of proceedings, ed. by Hans-Hermann Hartwich (Opladen, 1989).

politically selected as positive or negative; every intentional or careless unofficial statement by upper echelon officials or politicians; many types of intrigue; being seen and not being seen on certain occasions; promoting or not promoting political careers; and naturally the political election with everything that it reputedly or actually influences.

We have, moreover, to take into account that politics is not simply a network of actions influencing one another. Politics is in a fundamental sense primarily communication, that is to say a continuous synthesis of information, transmission, and comprehension that reproduces the system from moment to moment. If we pay attention only to communicative action, we lose sight of the fact that this action when identified is always observed and attributed, and thus almost simultaneously produces effects that can go far beyond the intentions of the actors. From moment to moment political news becomes common knowledge; or rather the system operates under the fiction that this is so; and anyone who wishes to participate and to continue to do so is well advised to be informed or to appear to be so, regardless of which intentions he wishes to have attributed to himself as his own actions.

A political system in modern society is more to be compared to a nervous mass than an executive hierarchy. But we have no need to turn to extremes of this sort: the truth lies somewhere between smoke and crystal, namely in a combination of a very high degree of variety and of redundancy.[37] Thus the thoroughgoing personalization of political communication is to be explained in the twofold sense of both people and knowledge of people being important and both being so as values specific to the political system; that is to say as stable factors arising from the recursive application of political communication to the results of political communication.[38] Taking recourse to personified identities provides thematic variability with a great deal of scope, even if individuals cannot change their personal line at will without endangering their credibility.

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37 See Henri Atlan, *Entre le cristal et la fumée* (Paris, 1979).

38 A special aspect of this form of stabilization by recursively effected personal identity is the tendency to react morally to disappointment with people – as if one is not to be attributed oneself with not having known them better.

Despite its operative closure this system always proceeds by both self-reference and external reference. It engages in politics only for the sake of politics (whatever personal merit individual politicians might attribute to themselves), but at the same time it combs the environment for subject matter to turn into politics. Precisely because the system is operatively closed, it is open to stimulus from without that can, however, be handled only internally, in the form of politics. This leads to perturbation caused by the environment; for example, a widespread and increasing sensitivity to inflation or unemployment evolves in the long term into a structural trend, although the system can modify its own structures only by means of its own operations.[39] This means neither that the system adapts progressively to the environment, nor that it becomes more and more similar to the environment in the sense of a trend towards dedifferentiation. The opposite is true. If the system is able to continue in its course of self-determination, differentiation increases, because the perturbations it reacts to are always states of the system itself and not states of the environment imported into the system.[40] Whether increasing inflation becomes a problem for the political system – be it that distribution conflicts have to be defused with the help of inflation, be it that public concern has to be appeased – is not an economic but a political question.

We may thus assume that perturbation caused by the expectation of being able to guarantee a risk-free society, or also that caused only by public opinion demanding stricter regulation than decision makers and experts would consider rational,[41] will also in the long term influ-

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39 At this point we are only repeating a very generally applicable statement on the relationship among system autonomy, structural couplings, accumulation of perturbations, and morphogenetic tendencies such as could also be formulated with respect, for example, to evolution theory, socialization research, and numberless developmental dependency relations within society.

40 It is only in this way that the evolution of life on the basis of unique biochemical invention leads to the differentiation of species; and it is only in this way that the apparent connection between socialization (including deliberate education) and the individualization of psychic systems can be understood.

41 On technological risks see: Gerald T. Gardner and Leroy C. Gould, 'Public Perceptions of the Risks and Benefits of Technology.' *Risk Analysis* 9

ence the structural development of the political system. To understand how this occurs (we see no possibility of predicting what will result) we have to distinguish two sides. Externally the political system claims a controlling competence. It attempts to make decisions that eliminate perceived risks or at least reduce them to levels below limiting values, transforming them into tolerable ones. On this level the political system reproduces its own approachability, its own openness towards subjects of this sort. In the process it profits from concentrating on the currently topical subjects to the exclusion of other risks. And it profits from the relative ease – an only internally complicated process – with which collectively binding decisions can be obtained. This has been referred to as 'symbolic politics'. The decision itself is regarded in the day-to-day business of politics as proof of success. One has been able to formulate it and push it through. One can mention it in reports on the past legislative period, and it is by no means unrealistic to assume that it has a modifying effect of circumstances. The question is only what effects?

From an internal point of view the perhaps most important aspect of this proceeding is a transformation of risks, a transmutation of perceived into other risks. In this connection we are thinking primarily of the specifically political risk that a certain risk limitation policy will not pay off politically, will not pay dividends in the form of electoral victory – for example, because other subjects of overwhelming urgency have since caught the public eye. Every risk-related policy can and must, moreover, be understood as a sort of natural experiment. Only implementation will show what consequences ensue, which decisions observers of this politics make, and in what direction risks are thereby shifted. But by that time one is usually no longer in a position to revise the initial decision and to undo what has been done. One is faced with circumstances defined as 'new' and has consequently to seek political solutions.

These reflections imply that in risk management the course of time plays an important and politically perhaps decisive role. The inascer-

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(1989), pp. 225-242 (p. 236, Table VII). Aids research also appears to come up against a similar problem of exaggerated demands on politics with the discrepancy between the willingness to modify one's own behaviour and the demand for state intervention.

tainable simultaneity of all important points of view is replaced by the sequence of decisions. This sequence is punctuated by the time structures of the political system – for example, by the rhythm of elections, the legislative periods, the stability or instability of governments, and also by the foreseeable consumption of time by the processes of making decision and seeking consensus, which can be modified by a strategy of urgency or delay but which cannot be arbitrarily abbreviated or expanded. The time specific to the political system[42] differs from the time that organizes sequentiality in the social system and its environment. The time specific to the political system is thus no guarantee against surprises. Its own time system alone subjects the political system to constant perturbation from the environment, and a certain resilience or indifference is required in choosing what one wishes to react to. But once again this is not to be understood as the actor's freedom to decide. The inevitable result is that the political system can work only as an operatively closed system determined by its own structures, only as a non-trivial historical machine, only on the basis of self-organized recursiveness.

V.

Being fully temporalized, the political system is not in a position to retain the burden of risk imposed on it and to struggle continuously with the same cases. Politics works in episodes, in short stories each finishing with a collectively binding decision, a symbolic gesture of conclusion. The political system is thus free to turn to new topics or to await feedback from old ones. But what happens with the risks?

In most cases the are handed over to the legal system, and are very often passed on by the legal system to the economic system. This

42 Helga Nowotny would speak of 'expanded present (ausgedehnter Gegenwart)' to refer to certain subject matter being able to be treated as currently topical for more than a limited period of time. See *Eigenzeit: Enstehung und Strukturierung eines Zeitgefühls* (Frankfurt, 1989). It is, however, important that during this very specific present the world does not come to a halt, but changes at the same time, so that the expanded present cannot be extrapolated to a 'world-time' present.

usually happens in the form of prohibition subject to conditional permission (licensing). A legal form of great practical significance especially created for this purpose is the fixing of 'limiting values'.[43] For example, if it has been established or can at least be demanded that the skin of apples ought to be as smooth as possible to stop bacteria adhering to it too easily, a regulation is conceivable that fixes the permissible depth of wrinkles on marketable apples. A limiting value of this sort digitalises the problem; it is a form with two sides, one of which indicates what is forbidden, the other what is permitted. The forbidden and the permitted are thus skilfully combined under a single marking, and this marking can be shifted if changes in the state of knowledge or political pressure make this advisable.

Regulations of this or a similar type momentarily rid the political system of the problem, while at the same time setting the conditions for possible repoliticization. If a rule has been made that is to be acknowledged as a valid law, which for example, declares a 'residual risk' to be acceptable,[44] the legal system can attribute the decision to 'democratically legitimated organs of the state'[45] – thus dismissing the problem. The differentiation of the system solves the problem. It

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43 There is a great deal of literature, particularly on the problems of individual concrete limiting values. For a summary see, for example, Gerd Winter, ed., *Grenzwerte: Interdisziplinäre Untersuchungen zu einer Rechtsfigur des Umwelt-, Arbeits- und Lebensmittelschutzes* (Düsseldorf, 1986); Andreas Kortenkamp et al., eds., *Die Grenzenlosigkeit der Grenzwerte: Zur Problematik eines politischen Instruments im Umweltschutz* (Karlsruhe, 1989). On the subject of limiting values as form see also Niklas Luhmann, 'Grenzwerte der ökologischen Politik: Eine Form von Risikomanagement.' MS (1991).

44 In Anglo-American law one speaks of a *de minimis* rule (although the civil law precept *de minimis non curat praetor* deals with different problems). See Miller B. Spangler, 'Policy Issues Related to Worst Case Risk Analysis and the Establishment of Acceptable Standards of De Minimis Risk.' In Vincent T. Covello et al., eds., *Uncertainty in Risk Assessment, Risk Management, and Decision Making* (New York, 1987), pp. 1-26.

45 See, for example, B. Bender, 'Das Risiko technischer Anlagen als Rechtsproblem des Verwaltungsrechts.' In Sylvius Hartwig, ed., *Große technische Gefahrenpotentiale: Risikoanalysen und Sicherheitsfragen* (Berlin, 1983), pp. 217-237 (218).

lies dormant between the systems, so to speak, until one or other of them takes it up again for internal reasons.

To be able adequately to understand this, we have to abandon the notion of a relationship of domination between politics and law in the sense of a hierarchical authority, or superordinate political power. Although this notion had developed from the medieval quasi-identity of *imperium* (*potestas*) and *iurisdictio*[46] in the maturing phase of the territorial state (Suárez, Hobbes, Pufendorf), and had especially in the legal sources theory of nineteenth century legal positivism successfully rebutted all attempts to return to natural law, it is nonetheless empirically untenable; for both the political system and the legal system are far too strongly determined by their own complexity. We thus replace it by the concept of 'structural coupling'.

The legal system is used politically in a somewhat different manner when, more or less in analogy to property, it serves to consolidate the negotiating positions of public institutions. The corresponding legal norms still appear to be intended for application, and the legal system will also read them in this light. In fact – and probably more and more often with intention – they serve to provide those instances authorized to implement the law with negotiating power. These agencies can then threaten strict application of the law or corresponding exercise of discretionary powers to obtain tractability in dependents in other, not directly enforceable respects. Frequently a sort of negotiated application of the law occurs, the danger of recourse to the courts being eliminated by settlement.[47] In fact it represents an unofficial form of delegating and enhancing political power with access to detail, and thus at the same time a form of delegating decision making on risks.

In all these cases the attention of the legal system is drawn to the particular significance of political processes by its own structures (above all constitutions). This does not mean that any political deci-

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46 See Pietro Costa, *Iurisdictio: Semantica del potere politico nella pubblicistica medievale* (Milan, 1969); Brian Tierney, *Religion, Law, and the Growth of Constitutional Thought 1150-1650* (Cambridge, England, 1982), p. 30 ff.

47 On justifiability in the constitutional state see: Wolfgang Hoffmann-Riem, *Konfliktmittler in Verwaltungsverhandlungen* (Heidelberg, 1989).

sion that is not at the same time a legal decision (for example, a vote in parliament) could issue directives to the legal system. The institution of political opposition and the imponderability of the political lobby alone would prevent this. However, the legal system is particularly subject to perturbation by the political system. Not least of all, this also entails an elimination of direct societal influence on law. Such influence can be disregarded in the legal system as long as it does not assume political form, that is to say does not jell into collectively binding decisions.[48] Due to this eliminative function, this canalization increases the probability of perturbation – as we have already seen in the relation of the political system to intensified societal risk situations and sensitivity to risk. But this does not change the fact that the perturbation itself together with the ensuing reaction (Piaget would speak of assimilation and accommodation) are states purely internal to the system.

Despite the autopoietic autonomy and operative closure of the legal system, such structural couplings permit long-term trends in structural change to prevail that an observer – should his theory dispose him to do so – can attribute to external causes. We therefore suspect that the legal system comes under precisely describable deformational pressure if the political system transmits to the legal system its sensitivity to questions of risk.

This process gains in importance – and for this reason we have spoken of 'deformation' – especially because, as we have seen, risk is not a genuinely normative problem but can be reduced to other forms of social burden caused by time-binding. We can recognize this in specific legal decision making problems that can no longer be taken into account if the political system seeks salvation by passing on responsibility for dealing with risks to the legal system. Today evalua-

48 Or, we must add, use the structural couplings between legal system and economic system, i.e., transforming transactions into the form of contracts that alter property relations or create legal rights.

tion of its capacity to react varies.[49] This is true, for example, for the following:

1. Causality problems involving long-term remote effects and an incalculably high number of contributing causes;
2. The transition from liability for fault to strict liability, for the purpose of solving the problem of loss distribution in the case of *lawful* action;[50]
3. Problems relating to the right of action in situations of interest and exposure to danger that cannot be dealt with in the form of an (*eo ipso* actionable) subjective right;
4. Rules on the onus of proof that used to be invoked only as an aid in taking into account the prohibition of a denial of justice, but that now have progressively penetrated the heart of the norm programmes themselves;[51]
5. For the expansion of administrative-regulatory activity, with manifold consequences such as questions of liability for error, or in relation to learning processes in the administration that cannot be temporally coordinated with investment decisions taken by the environment; increasing strain put on the fiction that the law is known; increasing needs for negotiated overall solutions that accept partial illegality[52] – to mention only a few;

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49 It is at any rate insufficient to trace recognizable reluctance simply to the 'fears of the judge' or to his bourgeois-ideological prejudices, as Gerd Winter, 'Die Angst des Richters bei der Technikbewertung.' *Zeitschrift für Rechtspolitik* (1987), pp. 425-431, does – without paying any attention to the structural restrictions imposed on any transformation of the legal system. We can respond to the complaints about the immobilism of the law only by pointing out that far-reaching changes in systems with a high degree of structured complexity have consequences going far beyond what the change was intended to bring about. This can be accepted as a risk, but not without generating new affected involvement.

50 For more detail, see Chapter 3, p. ... f.

51 On related questions of litigation risk and its effects on the development of law see W. Kip Viscusi, 'Product Liability Litigation with Risk Aversion.' *Journal of Legal Studies* 17 (1988), pp. 111-121.

52 See Gerd Winter, 'Bartering Rationality in Regulation.' *Law and Society*

6. The extent to which risk prevention measures taken by the legal system affect the innate dynamics of other function systems (particularly of the political and the economic systems) and within these systems block the assumption of risks for the sake of the advantages involved.[53]

In all these cases there is the added complication that the legal system is confronted by risk problems not only indirectly via the political system but also directly by litigation. Thus the transition from the principle of liability for fault to that of strict liability (primarily in common law countries, but also in Japan[54]) was performed largely by the courts, and was converted into dogma by jurisprudence; so that in promoting corresponding regulation, the political system can fall back on preliminary work done in the legal system and on legal precedent. George Priest speaks of a quite dramatic change in United States civil law brought about by court rulings guided by such considerations as risk control and the internalization of costs as an alternative to bureaucratically too cumbersome and politically too dependent 'regulatory agencies' with a limited budget and limited powers.[55] Apparently the legal system itself registers the advantages and disadvantages of legislation as a solution dependent on politics. As an alternative it actuates new and far more drastic ways of dealing with the future, which are politically unacceptable (but possibly open to correction by the legisla-

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Review 19 (1985), pp. 219-250; Georg Hermes and Joachim Wieland, *Die staatliche Duldung rechtswidrigen Verhaltens* (Heidelberg, 1988).

53 For a general treatment see Udo Ernst Simonis, ed., *Präventive Umweltpolitik* (Frankfurt, 1988). Juridically this argument occurs in the form of the law leaving certain decision up to the political system or to the market, because the corresponding risks can be more accurately and responsibly evaluated by these systems. See Winter, op. cit. (1987), p. 425 f. From a sociological point of view it is a matter of incorporating the allowance for functional differentiation in a functionally highly differentiated system.

54 Especially on this subject, see Shigeto Tsutu and Helmut Weidner, *Ein Modell für uns: Die Erfolge der japanischen Umweltpolitik* (Cologne, 1985).

55 George L. Priest, 'The New Legal Structure of Risk Control.' *Daedalus* 119/4 (1990), pp. 207-227.

tor). The individual-related principle of liability for fault is relegated to the background; substantiation requirements with respect to the responsibility for losses are drastically reduced and responsibility is shifted to where the alternatives can be calculated (and paid for!). Penalising risky behaviour is more the task of liability law than penal law, thus taking effect only when a loss has actually occurred. But by this very circumstance it causes this possibility – attentive to risk and precautionary in nature – and its uncontrollable dimensions to be taken into account. This instance shows that and how the problem is again shunted across system boundaries, partly to private firms, partly to local authorities, partly to the economic system's insurance market. And these systems react by reducing the range of services offered, by cutting programmes where the burden of risk appears to be too high.[56]

Where the political system itself chooses the form of legal regulation to depoliticize the problem and to transfer it to another system context, the lawfulness of the decision must be investigated. Despite what the legal concept of the state might suggest, it is by no means self-evident that what is politically convenient is also lawful; for it is another system – the law – that has to decide the issue. Under conditions of the rule of law, the political system will not in general tend to act in a crassly unlawful manner, thus openly provoking the legal system; for this would at the same time represent political failure. More typical is the case where in the political phase of the decision making process, the legal status of a decision is not yet fully established. A typical situation is that the political system has to assume a legal risk with regard to the results produced by political decisions. In this respect, too, politics transforms risk. It modifies risk for itself and for participants by transferring it to another context where other weapons are deployed and different stakes are played for. Careful legal scrutiny can restrict the leeway for political decisions from the outset. But for the sake of politically satisfying – often compromise – solutions, legal risks are often taken very consciously. One then has to be able to present a 'reasonable' legal construction and can, should the courts decide otherwise, take comfort in having at least attempted

56 See survey results in E. Patrick McGuire, *The Impact of Product Liability* (New York, 1988). See also Nathan Weber, *Product Liability: The Corporate Response* (New York, 1987).

a politically sensible solution. As the process of balancing interests engenders uncertainty within the legal system itself, the situation of legal risk in politics becomes normal and can be practised without objection; for legal decisions can then no longer be anticipated, and one has at least presented good arguments – if only because one represents reasonable interests.

We now have the overall impression that the legal system – partly in obedience to political impositions, partly as a consequence of developments in court practice – is progressively giving up incorporating the predictability of the legal consequences of its own conduct into norm programmes as a condition and limit. This means that even self-determination in legal matters is no guarantee against surprises; it, too, becomes risky, and one seems progressively to assume that this is acceptable in a highly organized society, since in such cases there is sufficient provision for organized prophylactic or follow-up measures.

Many roads by which risks are passed on finally lead to the economic system. This system is characterized by a good capacity for calculation and a bad memory. Households and enterprises can indeed calculate what happens in their own housekeeping or business arithmetic if they have to enter expenditures into some account or other. At the same time, however, the consequences for the money flow itself, i.e., in relation to those who receive the money and those who do not, are difficult to trace; for money is reshuffled at every financial transaction. We may ascertain that insurance companies enjoy considerable growth, that insurance companies are entering the banking business, and bankers are going in for insurance. But who would venture to attribute this to certain legal policy measures taken by a certain government? Money does not remember why it was paid out. The consequences of a policy of passing on risks might thus finally dissipate in a putatively wealthy, at any rate pecuniarily well-supplied economy – only because this system has no way of politically asserting a claim to its own opportunity costs. We shall take up this subject again in the following chapter.

VI.

We have hitherto assumed that the political system reacts to risky situations in its environment by making decisions to provide remedies or at least to reduce risk-related dangers. However, the political system has in fact two possibilities – for it would otherwise not be a matter of decisions – namely to intervene or not to intervene. Both possibilities involve politics assuming a risk in its own right.

Externally, politics is presented as a more or less successful – at any rate purposeful – attempt to reduce the dangers that can result from risky behaviour. Politics presents itself as a system of societal control. This alone may dispose it to action rather than inaction. We seldom find mere inaction entered on the credit side of governmental balance sheets. This version modifies with the growth of scepticism about the feasibility of control. We could then conclude that from a realistic point of view, a political system subject to constant perturbation from risk only has the opportunity to transform – as it were on the off-chance – external risks into internal ones, into risks incurred by its own decisions. Its own risks then take two forms: one can decide to regulate the matter in question and thus to take the responsibility for the consequences, or one decides to wait and see, to commission further expert opinions; and then one either witnesses a dedramatization of the situation or is confronted by progressive degradation, by growing costs, by less time for manoeuvre.

The double option to act or not to act corresponds to the dependence of political decision making on time, on favourable moments (*kairós*) with the risk of reacting too early or too late. This was once taught under the name of *prudentia* as an individual virtue of the prince and examined in its moral complexity. Today, too, there is at least consensus that this problem cannot be reduced to a matter of rational decision making, since identifying the conditions for rationality alone requires far too much time (and in principle infinite time), thus amounting to postponement. Rationality cannot be attained without taking the temporal aspect into account. In such circumstances of dependence on time and opportunity, it is only a form for representing the intention not (or at least not for the time being) to decide. Instead one interrogates experts or seeks consensus. It would nevertheless be just as wrong to conclude that politics is in principle irrational, i.e to

cross to the opposite side of the form. The question is rather whether the form schema rational/irrational is at all suitable to deal with this condition of time dependence, which turns back reflexively into itself. And there are good reasons for observing political decision making as risk *instead*. And also to do so precisely when politics, as we have suspected, is not in a position to present itself as risky decision making.

In these circumstances, the rationality of specifically political risk management could consist in weighing the risks of deciding one way or the other, and being careful to consider the protest potential of side-effects and the electoral power of those affected. And depending on the solution chosen, it may be advisable to stress the possibilities or the difficulties of intervening for the purpose of control.

Chapter 9
Risk in the Economic System

I.

The political system attracts risks from all sectors of society, partly to absorb them as the political risks of over-reaction or of oversight, and partly to pass them back to society. The economic system, on the other hand, is the last resort for risks from all directions – which it naturally seeks to safeguard against by incurring costs.

For our purposes, only risks that have to do with time differentials in the use of money, that is above all investment and credit risks shall be deemed economic risks. For the problem of a failed harvest in farming or a production error in industry is only a danger – unless such phenomena are considered from the point of view of the misguided investment of capital and labour. In what follows we will be dealing consistently with the risk that anticipated payments (from sales, rentals, loans etc.) are not made. Risk in the economy is insofar a strictly money-economy problem. And risk depends not least of all on the possibility of restricting the domain of the consequences to be taken into account (or, to use a frequent but inaccurate phrase, to externalize 'costs').[1]

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1 The frequently expressed criticism of such externalization is misplaced for very fundamental reasons. For every measure taken to reinternalize 'costs' would in its turn externalize 'costs' – or would have to renounce all auditing of economic rationality. A political programme to raise safety levels and reduce risks (such as in the field of consumer protection) could not be economically calculated if innumerable consequences were not disregarded. 'A final, and very important, externalities argument emerges when we consider the production of safety itself', according to Peter Asch, *Consumer Safety Regulation: Putting a Price on Life and Limb* (Oxford, 1988), p. 46

For it is above all the peculiarities of the symbolically generalized communication medium of money that permits the economy to assume risks – and to expose itself to danger. Money can be employed in practically any amounts. Small payments can be saved to form capital and big sums can be broken down into smaller amounts and paid out to various recipients for various purposes. In the process, nothing is gained and nothing is lost that is not transferred in the course of the transaction itself. It is thus possible to calculate using a balance sheet for a specific enterprise or a budget for a given household. In other words, the money supply has no holistic qualities that could be gained or lost apart from the aggregated purchasing power or the access to the credit market that larger sums of money offer.

This reduction to quantity is paralleled by the abstract nature of money that consigns to oblivion the characteristics of situations, the motives for payment, and the type of counterperformance momentarily coupled with the transaction. In each successive pair of hands money can be used as if it were freshly minted – even if acquired by fraud or theft. It operates without a memory. Thus at the next stage it also forgets the risks that had been assumed in acquiring or spending it. This naturally does not mean that the economy can function practically without risk; but it does mean that the risks adhere to the 'modules', the enterprises and households that decide on the uses to which money is to be put. They will possibly regret a payment – but this has no effect on the recipient. The risk is not passed on along with money as it is when goods are transferred. If one imagines an economy to be a network of transactions, this means that risk flows in only one direction, i.e., only in the direction in which goods or claims are acquired and paid for, where the price is compatible with the ability to pay. The fortunate recipient of the money is at liberty to assume new risks.

Given these qualities of the money medium, the economy can be regarded as a gigantic market for risks. However, this does not mean that risk can be continuously and totally reduced to object-specific risks as in buying a used car. A residual risk remains, a central risk, that of *solvency not being re-established.* It can be that the person who has spent money is not able to replace it because his venture proves to be a misplaced speculation. It can also happen that creditors urged to accept payment at a later date raise their claims, demand higher prices, or – in extreme cases – prove unwilling to accept

promises of payment at all. Even if solvency can be restored, money is later worth less or nothing. Whereas in the first instance the risk lies in spending money, in the second case it is in accepting it. In both cases the risk is inherent in the financial transaction. If it does not occur too often, the first situation can be dealt with by the economic system as a withdrawal of participants. It can then be neutralized. Whoever has no money and cannot acquire any no longer participates. Only when such instances become widespread does a general lowering of prices take place. The economy reacts for as long as it can by deflating. In the second case we are dealing with the (not exactly symmetrical) opposite case of inflation. The economy defends itself by means of higher prices to generate willingness to accept money.

Deflation and inflation are in a certain sense immune system reactions of the economy, reactions against too high a risk burden. Like all reactions of the immune system, they are not harmless. As soon as they show in prices, they intensify the problem they are reacting against. Under deflationary conditions, whoever still has money will spend still less (or will at least spend it later). Under inflationary conditions, whoever has to rely on accepting money will tend to contribute to the rise in prices. This self-intensification effect is, however, not part of the decision making risk on the part of the person paying or receiving payment. At a higher level of aggregation it rather represents a danger with which the economic system itself has to cope. In these terms we can also say that the economic system tends to transform overly massive, general, and above all externally induced risks into self-endangerment.

Finally, all conditions for the calculation of risk by participants in the economy, including the banks, have to be considered. Here, too, it is primarily a matter of weighing up opportunities and risks. In this connection especially, any liquidity problems seem to act as a sort of disaster threshold, in proximity to which one is less willing to assume risks or no longer ready to do so.[2] On the other hand the pressure of competition leads to risks having to be assumed, with the only alternatives being either to reduce the volume of business, or in the last resort to drop out of the market. This applies to both supplier and bank

2 See Peter Lorange and Victor D. Norman, 'Risk Preference in Scandinavian Shipping.' *Applied Economics* 5 (1973), pp. 49-59.

credits. It makes itself felt in very different ways in different business sectors; and depends for its effect on the size of the debtor's business. Consider, for example, the credits granted publicans by breweries or – in a new development – by slot-machine operators; or those extended by textile producers to the more or less fashion-dependent clothing manufacturers. It is often only a willingness to accept delays in settlement of claims. Perhaps the most spectacular instances are the high country credits extended by commercial banks, traceable back to a considerable surplus of funds and a lack of demand for loans in the industrial countries in the 1970s, but also attributable to the necessity of remaining a participant. From a formal point of view, such cases can also be categorized under risk calculation if we regard dropping out of the market as an avoidable risk of risk aversion. But the structure of the problem is different: the risk of losing a market is an almost certain consequence of risk aversion, and the entire problem arises not from investigating and possibly miscalculating the credit standing of the debtor, but from observing the market; that is to say, observing the competition, i.e, observation of the second order.[3]

As in the question of deflation/inflation, we are here confronted by the structural effects to be expected in highly differentiated function systems. As the system becomes more complex and more opaque to itself, one turns to observing observers.[4] At this level of second-order

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3 See Dirk Baecker, *Information und Risiko in der Marktwirtschaft* (Frankfurt, 1988), esp. p. 198 ff.

4 In the scientific system this takes the form of orientation towards publications. See for example Charles Bazerman, *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science* (Madison, Wisc., 1988). The complexity of the system requires even persons of high social prestige (occasionally king and queen) to forego witnessing the experiment itself, as had been usual in the early days of the Royal Society of London, and imposes the risk of being guided by mere publications – which base their legitimacy on establishing for themselves a position in relation to other publications. For the political system there is a parallel situation in politics being guided by the observation of politics by what has (also since the eighteenth century) become established as 'public opinion', with a similarly homemade guarantee furnished by the freedom of press and opinion. See Niklas Luhmann, 'Gesellschaftliche Komplexität

observation, which produces many problems not dealt with here, the direct analysis of the risky situation is replaced by observation of other observers without being able to assert that the latter had been able to examine the matter in question directly. If they are willing to assume risks, one has to follow their lead or accept the consequences of reluctance.[5]

What from a more or less individual psychology point of view could be seen as constraint on recklessness is from another standpoint – namely when looking at the economic system as a whole – an enhancement of the willingness to assume risks. As the system begins to operate at the level of second-order observation, and everyone sees everything from this vantage point, bigger risks are incurred as participants imitate the willingness of others to take risks – although precisely this factor raises total indebtedness and thus total risk. Correspondingly novel institutions are developed to provide safeguards. Finance markets are established to permit banks experiencing temporary difficulties to recapitalize, and subsequently to bear only the risk of losses from higher interest rates on refinancing. And insurance companies develop complex systems to reinsure possible losses.

The economy as a whole proceeds on the assumption that now it is not rational either for the banks or even for private households to meet all payments from their own financial resources or savings. The debt – equity ratio is correspondingly high. There are, however, no clear limits – because it depends on too many unforeseeable factors whether payments expected are in fact made. As with the ecological consequences of technical production, innumerable individual decisions contribute to the emergence of a no longer attributable overall endangerment. From the point of view of our risk/danger distinction,

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und öffentliche Meinung.' In Niklas Luhmann, ed., *Soziologische Aufklärung*, Vol. 5 (Opladen, 1990), pp. 170-182.

5 In the course of a discussion with Viennese bank managers on the background of the overindebtedness of the COOP group, it was said that banks had been guided only by which other banks had also granted loans, and would have been better advised to have noted which banks had *not* granted loans. In view of the impossibility of throwing light on the question oneself (the group was regarded as a sinking ship), it was a matter of second-order observation in both directions.

this is in a strict sense paradoxical, since it is both attributable and not attributable. It then depends on who observes and assesses the situation whether the threat is seen as an attributable risk (attributable to decision makers difficult to identify), or as a danger to all triggered by systemic structures.

II.

Understanding the subject of risk in the economic system, but also the development of the economy as a whole – particularly in the twentieth century – requires examination of the banking system. Whereas classical economic theory, making use of basic concepts such as production, exchange, or distribution, interprets the economy from the viewpoint of production and consumption or trade, a sociological theory tracing intrasocietal differentiation in the economic system to the symbolically generalized communication medium money[6] must prefer to place the banks (and not industry) centre stage.

Like the courts in the legal system[7] the banks have their place at the heart of the economic system.[8] Seen from their point of view every other sort of economic operation that take place is peripheral to the system. Only the banks, with their division into central bank, commercial banks, and bank customers, form a hierarchy (again like the courts in the legal system or the organization of the state in the political system). And finally we can understand the function of banks (unlike the function of production) as a concentration of the function of the economic system *per se*.

For it is the task of the banks to provide the economy with unfailing solvency. They make payments possible even where enterprises or

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6 See Niklas Luhman, *Die Wirtschaft der Gesellschaft* (Frankfurt, 1988).

7 See Niklas Luhman, 'Die Stellung der Gerichte im Rechtssystem.' *Rechtstheorie* 21 (1990) pp. 459 – 473.

8 The comparison does, however, have limits, and fails if we extend it to history. Courts are among the oldest institutions of the legal system; they generate the differentiation of law, whereas the banks, whatever may be said with regard to ancient Greek or even Mesopotamian exceptions, gained their present significance only in modern times.

private households do not dispose of the necessary resources, or where they would prefer not to convert tangible assets into cash while nevertheless remaining able to make payments. The banks thus help to a degree adequate for the autopoiesis of the economy to distinguish material assets or labour availability on the one hand and financial resources on the other. Only this process enables transactions to be carried out in dimensions that make it worthwhile to differentiate markets and to produce for markets (and not for personal consumption). This engenders a differentiation of the property code (in relation to material assets and disposal of one's own labour) and the money code; it is only in this way that a secondary coding of property by means of money is realized. The name for this function, which conceals more than it reveals, is credit.

In the transitional period that began four thousand years ago in the trade metropolises of Mesopotamia,[9] and lasted into the eighteenth century of the modern era, there are functionally quite equivalent institutions that prepared the economic ground for the advent of a banking system. This is particularly true for trading capital and, especially in the eighteenth century, for public borrowing. Today, too, public borrowing serves to an ever increasing extent to create money, thus overlapping in function with the banking system. This is indicative of the problematic relations between the political decision makers and the central banks. However, as the problem of inflation emerges as a prime political problem as well, and as global financial markets come into being, the banks assume this function of generating and distributing solvency. At the same time, the banks come to face new competition closer to home: competition from insurance companies, building societies, pension funds, credit card organizations, and investment brokers; or competition from big customers themselves, powerful enough to gain their own access to the financial markets.

By virtue their function and their position in the system, banks are concerned with economic risk. It is scarcely an exaggeration to say

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9 But probably not in the highly differentiated form of the depository bank. On the history of the latter see Raymond Bogaert, 'Ursprung und Entwicklung der Depositenbank im Altertum und im Mittelalter.' In Raymond Bogaert and Peter Claus Hartmann, eds., *Essays zur historischen Entwicklung des Bankensystems* (Mannheim, 1980), pp. 9-26.

that transforming risk is the real business of banks. They take payment in order to do so. Their function requires them to ensure perennial solvency in the economy, that is to induce a certain time balance between the opportunity to pay and the ability to do so. This is accomplished by determining future payments now in a form already usable at present. One does not simply wait and see if the debtor will pay his debts, but gives the claim a presently negotiable form. Above all, however, the banks take money against a promise to repay it at a future date, then taking advantage themselves of the loan period to lend money, i.e, to acquire promises to pay in their turn. Thus banks deal in promises to pay.[10] Should they themselves face liquidity problems, they can within certain limits freshen up their own ability to pay on the interbank market. In this manner many risks are balanced out and distributed; or also marked in such a way that greater willingness to assume risks is combined with greater (but riskier) opportunities to make profits. In addition to their own risk management, banks take on consultancy tasks, thus dosing financial investment in proportion to the readiness to take risks or to the information-processing capacity of their customers.

This business with risks has two preconditions. The first is that one need not know the world and can thus treat market movements, modified by temporal contexts, as the product of chance. Although banks or functionally comparable dealers in risk may in many cases be better informed than their customers, they have in principle to establish their business on the basis of chance. Knowledge can to a certain extent allow them to limit and even avoid risks – but not to eliminate them. Adaptation to 'chance' creates a fictional reality, reality of the second order, a duplicated reality; for in the real world there is no such thing as chance. This duplication is the *sine qua non* for all statistical calculation.[11] But statistics are also no help for banks, for their

10 See Maurice Allais, 'The Credit Mechanism and its Implications.' In G. R. Feiwel, ed., *Arrow and the Foundations of the Theory of Economic Policy* (London, 1987), pp. 491-561; and now especially Dirk Baecker, *Womit handeln Banken? Eine Untersuchung zur Risikoverarbeitung in der Wirtschaft* (Frankfurt, 1991).

11 See George Spencer Brown, *Probability and Scientific Inference* (London, 1957).

field of activity is too strongly structured and, from a temporal point of view, too turbulent. Banks have to rely on internally developed risk-management instruments, and in this respect it proves both an advantage and an obstacle that they are organizations.[12]

The second precondition lies in the insufficiency of legal safeguards. For this reason we refer to promises to pay, and do not use the legal term of claim. The law can guarantee that one is in the right and remains so, even if the debtor does not satisfy the claim. It can help in collecting outstanding debts. It cannot ensure that the money is actually transferred. It fails in the face of insolvency. By establishing norms, the law in its own fashion distributes the social burdens imposed by time-binding; but it cannot release anyone from risks, not even from social risks.

Finally, in order to complete the picture, we must return to the triple hierarchy of the banking system; for it, too, serves to distribute risk. Like their customers, the commercial banks can themselves become insolvent. If there is no way out of the situation, a petition in bankruptcy has to be filed. Commercial banks distribute the risk of insolvency between themselves and their customers (which makes it risky, and makes too great a dependence on individual big customers or single market segments a typical cause of bankruptcy). The central bank, on the other hand, constitutes an exception. As an issuing bank it cannot become insolvent and therefore cannot check its money market policy against its own risk of insolvency. It has instead to monitor the international standing of its own currency, the refinancing possibilities on international finance markets, and the foreign exchange rates. This requires a money supply policy, which in turn requires observation of the entire economic system. All money policy intervention is then risky, since in this complex context it cannot be applied with any certainty of success, but at best in the short term and as a rapid reaction to events.

It thus seems reasonable to contend that with the aid of the banking system, the economy is in a position to observe itself from the viewpoint of risk; that is to say to choose a highly specific form of self-observation. The difference between the business of banking and other branches of business has precisely this function of drawing a

12 We will be dealing with more general aspects in later chapters.

boundary across which an observer can observe others and thus himself as well; and in this particular case in the specific perspective of risk. For banks, the behaviour of other participants in the economy is relevant only in relation to risk; to be exact, in relation to the banks' own risk, which among other things depends on how risky the business partners' operations are, how the latter observe the market, and how they are in their turn observed by other participants in the market – not least of all by the stock exchange. Within the operational scope of the banks, economic risk becomes self-referential at the level of second-order observation.[13] This means above all that for banks there is only risk communication and no security. Even its internal risk management is an inadequate guarantee for security; it serves only to proved the best possible commerce with uncertainty. And their business with risks is consequently a business dealing with the transformation of risks into risks of a different type or risks borne by others – but it is not a business that deals with risks in all security.

III.

In accordance with prevailing points of view we have proceeded on the assumption that it is the task of the banks as organizations, or of the banking system as an institutional hierarchy at the heart of the economic system, to process and give acceptable form to the risks arising from the temporal extension of economic proceedings. In recent times, however, financial markets have developed novel financing instruments that tackle more or less risky financing problems or the assumption of risk less by trusting in large, financially strong or at any rate solvent organizations, than by concentrating on the specificity of particular terms and conditions. In this context we would think of the volatility of commodity prices, of stock prices, interest, and exchange rates; of futures contracts of all varieties; of trade in options and of forms of risk allocation. This decentralizes risks and better adjusts them to suit the particular interests of business partners. Depending on the type of business and the concrete combination of forms, risks can in this manner be better distributed than if the classi-

13 See Baecker, op. cit. (1991), Chapter III.

cal bank schema were to be followed – allocating the risk only to either the bank (risk of bad debt) or the customer (deposit risk). Different instances of readiness to assume risk can then be mutually conditional – if you do then I will – and market orientation adjusts from classical rationality assumptions to tests of the willingness to take risks.[14] Speculation takes its cue from speculation. In other words, the observation of observation of the market is guided more and more by the prognoses of others and not only by the form in which it calculates its own business results.

Such financial instruments cannot, of course, come into existence without the cooperation of the banks. But where they become established, the general form of risk assumption can no longer very well be described in terms of hierarchy. It is rather a matter of 'heterarchy',[15] of 'modular' organization, networking the individual information-processing units, i.e, linking them up with their respective neighbouring units without the system as a whole imposing an organizational schema.[16] Such a system is a 'black box'- not only looked at as a whole and for the external observer, but also in its 'modules', its enterprises, and its households. The standardization of transaction types, proving their worth as financing instruments and risk distribution

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14 See Dirk Baecker, 'Rationalität oder Risiko?' in Manfred Glagow, Helmut Wilke, and Helmut Wiesenthal, eds., *Gesellschaftliche Steuerungsrationalität und partikulare Handlungsstrategien* (Pfaffenweiler, 1989), pp. 31-54.

15 On the origins of this concept in the context of neurophysiological research see Warren S. McCulloch, *The Embodiments of Mind* (Cambridge, Mass., 1965), p. 40 ff.

16 Joseph A. Goguen and Francisco J. Varela, 'Systems and Distinctions: Duality and Complementarity.' *International Journal of General Systems* 5 (1979), pp. 31-43 (41). The authors are of the opinion that such an order is more 'holistically' orientated than a mere hierarchy. See also Francisco Varela, 'On the Conceptual Skeleton of Current Cognitive Science.' In Niklas Luhmann et al., eds., *Beobachten: Konvergenz der Erkenntnisteorien?* (Munich, 1990), pp. 13-23 (20 ff.). Such an evaluation, however, requires the development of clear criteria. Nevertheless, hierarchies are certainly more vulnerable to the arbitrariness of individual decisions and to contingent contacts of the top echelon with the environment, for example, central banks taking note of political considerations.

mechanisms, contributes to a certain degree of internal transparency. One then at least knows about what one has reached agreement. However, the illusion will have to be abandoned that observing the top echelon (and observing in our terminology also covers handling, influencing, controlling) suffices to provide even a rough description of the system.

The innovations in financial techniques we have been speaking about are so new that a conclusive evaluation would be premature. Their development is far from complete (if it ever will be), and they have yet to be tested in a serious economic crisis. This is all the more reason to regard as problematic the tendency to make of the economy the final repository for all risks, covering them with thick layers of available money. The ecological risks that the societal system assumes are by nature unpredictable accumulations of effects, breachings of threshold values, suddenly occurring irreversibilities, and uncontrollable disasters. Exactly the same is presumably true for economic risks. But when the worst comes to the worst, the impact on society is more direct and more immediate.

Chapter 10
Risky Behaviour in Organizations

I.

Our analysis has hitherto examined the social system in modern society, even if in the latter chapters we have been dealing with function systems. Under the heading of organization we enter another world, a world of more restricted dimensions with distinct forms of its own, especially forms of system creation. Here we find forms of normality of a different nature, and for this reason – returning to the terminology of our introduction – other forms of fearing, describing, and averting misfortune.

The phenomena with which we shall be concerned in this chapter can certainly not be apprehended by noting individual preferences in decision making, not even if the variety of individual preference is taken into account and neutralized by aggregating the data; nor if we feel that evidence suggests organizations are in fact headed by individuals and can thus be treated as individuals.[1] But in sociology, too, which seeks to neutralize (or to use another term, control) individual differences in attitude, it is rather unusual to draw such a sharp distinction between the system forms of society and organization. The sociologist saves himself the trouble of underlining this difference not least of all because the sociology of organizations has developed into a special branch of the science that treats its subject matter as it stands – and not in relation to the society that surrounds and contains it. On the other hand, if a little thought is spent on the question, it is difficult to see how either society as a whole or any of its primary constitutive systems can be comprehended as an organized system.

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1 In studying management attitudes to risk one often relies in one way or another on ignoring organizational structures. See, for example, Peter Lorange and Victor D. Norman, 'Risk Preference in Scandinavian Shipping.' *Applied Economics* 5 (1973), pp. 49-59.

Society and its function systems produce their own unity by means of cross-linking and recursive reproduction of communication, to which they lay claim as their own in anticipatory and fall-back moves. This requires no formal organization. Identification signals circulating within the system suffice, making it possible to establish whether a communication is to be understood as science or politics, education or health care, an economic transaction or an amendment to or application of the law.

A quite distinct phenomenon is the formally organized social system (and it is only in this sense of the term that we shall be referring to 'organization') that marks its boundaries – and thus its mode of reproduction – by distinguishing between members and nonmembers. This difference functions as the identification signal typical for the organization. Organizations acknowledge as their own only communications between members, and only when they communicate as members. They can, however, make use of this difference above all to condition the behaviour of members as opposed to that of nonmembers. They can make joining and leaving (employment and dismissal) subject to conditions, and as a result describe these proceedings as decisions. The decision on membership is then also a decision to accept the conditions of membership; and this means deciding to accept the premises for deciding, including the conditions for the legitimate alteration or respecification of such premises.

This point of departure for contingent decision dependent membership permits the formation of autopoietic systems of a peculiar type. The elementary operations of such systems are decisions, and everything touched by their decisions are transmuted into the same type of operation.[2] Decisions are provoked by expectations that can be seen positively or negatively. To what extent alternatives are taken into account, and to what extent investigating them forms part of the decision making process is another question. The problem is not so much one of comprehensive, rational scrutiny leading to the only correct decision. It is rather that behaviour is treated in the first place as a decision within a network of decisions – and that this occurs regard-

2 For more detail see: Niklas Luhmann, 'Organisation.' In Willi Küpper and Günther Ortmann, eds., *Mikropolitik: Rationalität, Macht und Spiele in Organisationen* (Opladen, 1988), pp. 165-185.

less of the scope of scrutiny and the criteria of rationality. To be a decision, a decision requires other decisions. And if they are not as such consciously in evidence and communicated, they are simulated. By this process omissions become decisions, and zero values gain causality. Someone had forgotten to order supplies in time, to meet a deadline, to make note of a order, or to report a development taking place in his environment. All these nondecisions can inadvertently become decisions if subsequent decisions depend on this being the case. Moment by moment the network produces a history of decisions and prospects for future decisions, in relation to which something now has to be decided or – vice versa – cannot yet be decided.

If anything is taken up 'in the course of business' at all (and what else should one do with external stimuli?), it constitutes a decision that generates a chain reaction of further decisions. A two-phase development then very frequently unfolds: first, results are eagerly awaited, then – when the constraint of deciding has become inexorable – all that can be done is to rescue what there is to rescue.[3]

Given the impossibility of perfectly rational (optimum) decisions, and in view of the impossibility of anticipating what will have constituted a decision, all communication becomes a risk of having overlooked something that will subsequently seem relevant; or of having made a decision that subsequently seems wrong or in some other way objectionable. Nor does noncommunication provide protection against risk – since it, too, can be construed as the omission of a decision.

Essential characteristics of communicative behaviour in organizations – and in this context we often speak of bureaucracies – are to be explained in terms of this superimposition of risks on decisions. The breadth of the phenomenon excludes the more specialized differentiation of 'risk management' as a particular function of certain offices or departments.[4] It is rather to be seen as a particular form of critical monitoring of all decisions by means of second-order observation.

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3 Hann Trier maintains (personal letter to the author) that the artist experiences a similar two-phase structure when painting.

4 See also Matthias Haller, 'Risikodialog.' In Roswita Königswieser and Christian Lutz, eds., *Das systemisch evolutionäre Management: Der neue Horizont für Unternehmer* (Vienna, 1990), pp. 322-341.

The rationality of risk differs from purposive rationality[5] in that it proceeds on the assumption that achieving purposes that may involve explosive side-effects is subject to uncertainty, so that even the purposiveness of purposes can subsequently be called into doubt.

The matter in hand need not be world-shattering; but sensitivity becomes heightened to the point where even the small print is taken seriously, and care is taken that, should it come to the crunch, events can be consistently accounted for. Bureaucratic behaviour is notoriously risk-averse.[6] The overriding rule is never to permit surprises. But it must be remembered that this is a form of reaction to an unusually long-term state of risk.

There are numerous strategies for reducing risk in this connection. They include strictly respecting the distribution of powers and responsibilities, imposing or avoiding the written form; deliberately revealing or concealing the decision making process to facilitate or prevent later reconstruction; and above all involving others to engender privity and, as the case may be, complicity. The language of the bureaucrat, too, is a constant reminder of the decision making process: an application is made; a decision is taken; permission is granted; a complaint is lodged. A simple activity is raised to the dignity of a decision to undertake an activity. The language is thus a constant exhortation to pay constant attention even to trivial matters, but which then, in a manner typical for safety measures, becomes routine and cannot effectively prevent errors.

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5 These concepts compared by Ulrich Beck – perhaps in a somewhat different sense. See 'Die Selbstwiderlegung der Bürokratie: Über Gefahrenverwaltung und Verwaltungsgefährdung.' *Merkur* 42 (1988), pp. 629-646. See also the marked contrast drawn between risk and rationality in Klaus P. Japp, 'Soziologische Risikoforschung.' MS (1990), in the sense of commitment and noncommitment in the face of an uncertain future. This distinction makes the organizational interest in rationality (= noncommitment = reversibility = ability to reschedule) particularly clear.

6 See, for example, J. Ward Wright, 'The Bureaucratic Dimension of Risk Analysis: the Ultimate Uncertainty.' In Vincent T. Covello et al., eds., *Uncertainty in Risk Assessment, Risk Management, and Decision Making* (New York, 1987), pp. 135-143, one of the few studies dealing directly with a particular subject matter (handling of refuse disposal sites).

Among the transformations most fraught with consequence, which it is advisable for organizations to undertake, is to break a decision down into a large number of subdecisions and to order them in sequence. The creation of hierarchies also amounts to the establishment of sequential order. If several decision are considered necessary, they cannot be taken simultaneously, since what occurs simultaneously cannot be coordinated. They have to be taken one after the other, albeit in each individual case with recursive reference to what has already been decided and in anticipation of what is still to be decided. This allows the bureaucracy to license phase by phase the dangerous experimentation with large-scale technological installations, which have to be constructed so that risks can be identified and possibly eliminated. But in less imposing cases, too, the bureaucracy converts its decision making process into a sequence of decisions, thus gradually rendering the results irreversible. Such a procedure is justified by the illusion that at the *end* of the process one is still at liberty to decide on the *whole* matter. The final decision is postponed, every contributing decision claiming it as an alibi, until it becomes only possible as an acceptance of what has developed or – at a high cost of discouragement (everything in vain!), of loss of confidence and possibly actions for damages – of putting a stop to what has been initiated.

Insofar as a decision on the assumption of risk has to be taken – and risk can lie both in accepting and in rejecting a proposed decision – the organization will tend to concentrate probabilities in the direction of a higher degree of probability and/or improbabilities in the direction of a higher degree of improbability.[7] Pointers to security

7 This has also been demonstrated by studies showing that managers tend to overestimate their control over the consequences of decision in the enterprise. See James G. March and Zur Shapira, 'Managerial Perspectives on Risk and Risk Taking.' *Management Science* 33 (1987), pp. 1404-1418 (1410 ff.). On 'euphoria effects' within organizations (banks) cf. also Dirk Baecker, *Womit handeln Banken? Eine Untersuchung über Risikoverarbeitung in der Wirtschaft* (Frankfurt, 1991) (make-up p. 113). 'The ease of communication among insiders, the smooth course of business can conceal the fact that the underlying conditions have long since ceased to be what they once were.' Psychological research supports this view and shows that particularly under condi such as familiarity, involvement, competition and choice illusion c

are overestimated – be it in the direction of 'practically safe' or 'extremely unlikely'. Uncertainty is reduced in joint decision making or also in the form of project description by the protagonists. The solution initially favoured receives backing from arguments that present residual risk as acceptable. External resources, experts, imported supplier prestige or in-house investigations may help to absorb uncertainty. This can go so far as to produce the illusion of having risk under control before taking the decision. At all events, the effort invested facilitates the claim of having taken the greatest possible care and precautions if the decision were to come under fire at a later date.

Thus the prevailing impression is one of reassurance on a small scale. This also requires detailed cross-linking of highly refined expectations taking the shape of rules or forms provoking constant decisions by their content; or that use the same instrument to prevent one from glancing over the fence and noticing anything unusual. The same applies, incidentally, not only with regard to routine matters in the narrower sense of the term, but also to novel developments coming from above or from outside. In the future, attention is to be paid to this aspect or that; a report is needed in this case; in that event inquiries should be made. All this is to be done, the bureaucracy concludes – and nothing more. If they are to be capable of provoking decisions, expectations have to be specified. The board of the bank can simply demand that in future investigation of credit standing is to be more thorough. They might prescribe limits or, as on the occasion of the Coop scandal in Germany, point out that there are no unsinkable ships on the economic ocean. But every directive exists within bounds beyond which other risks lurk.

The system thus finds solutions to the problems arising from its own autopoiesis, to problems that it has, in other words, engendered itself. But finding solutions does not mean that everything will henceforth work well. The system makes use of the device of transformation; and we will see later that the strategies typically employed by organizations to deal with risk can have a negative effect on the environment as the risk of dealing with organizations.

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scope of one's own control arise. See Ellen J. Langer, 'The Illusion of Control.' *Journal of Personality and Social Psychology* 32 (1975), pp. 311-328.

II.

Among the most important experiences made in dealing with risk – and we refer to everyday experience rather than the results of research – is the change in assessment that takes place if, against all hopes and calculation, the losses hitherto considered unlikely do in fact materialize. As a general rule, the elements such as hope, opportunity, uncertainty, and frankness that determine the situation in which the decision was taken volatilize or prove to have been underestimated when it comes to reconstructing the decision making process after the event. The future of a past present is difficult to reconstruct as future after it has already become past. Events that have happened in the meantime can hardly be ignored. The calculus is not neutral with respect to reality; evaluation is revised retrospectively even if probability theory frowns on such practice. Harrisburg and Chernobyl have changed the assessment of safety in nuclear power stations for the worse; although the opposite argument seems just as reasonable – along the lines that one has learned from experience and that repetition can with a high degree of probability be excluded. Evaluation is at any rate not stable in the temporal dimension – and that is precisely what organizations fear.

Since Harrison and March, this problem has also been taken up by organization studies and given the name 'postdecision surprise' or 'postdecisional regret'.[8] The communications system – not to mention statistical procedures for evaluating decisions – has a tendency to give a positive assessment of the overall targeted state. This heightens the probability of disappointing surprises occurring in the aftermath

8 See J. Richard Harrison and James G. March, 'Decision Making and Postdecision Surprises.' *Administrative Science Quarterly* 29 (1984), pp. 26-42. See also Bernard Goitein, 'The Danger of Disappearing Postdecision Surprise: Comment on Harrison and March "Decision Making and Postdecision Surprises".' *Administrative Science Quarterly* 29 (1984), pp. 410-413. On the problems of quantitative calculation see also David E. Bell, 'Risk Premiums for Decision Regret.' *Management Science* 29 (1983), pp. 1156-1166. Also a general treatment of the 'ambiguity of the past', which in unexpected situations can rapidly become topical, see James G. March and Johan P. Olsen, *Ambiguity and Choice in Organizations* (Bergen, 1976), esp. p. 58 ff.

of a decision. If such surprises do occur, they stimulate the purposive search for causes, alter the causal constellation relevant for attribution and thereby engender additional surprises, especially by retrospective elucidation of the content of and responsibility for the decisions made. In serious cases, commissions are appointed to re-establish order in what had to be found out by chance. This shows that the falsification of memory probable in individual psychology (one had seen it all coming) cannot develop undisturbed in organized decision making contexts; it requires organization itself.

If what was, is, and will be decided changes in the very process of deciding, if alternatives emerge or fade, or if what is unimportant becomes important and what is important becomes unimportant, the criteria for evaluation should at least remain constant or, if they are changed, then this ought to be done explicitly and not with retrospective effect. We see the problem of special waste tips today quite differently from the way we used to, and for this reason previous decisions in this domain must almost inevitably be regarded as misguided. But this dismays every bureaucracy, since they need firm ground under their feet in a world where the context of decision making is in continuous fluctuation, and concern with the past and the future takes ever varying form. Precisely when one has to act in conformity with changeable laws, regulations, programmes and preferences, it cannot be accepted that what had applied in the past cannot now be retrospectively altered. One wants not only to know what applies now, but also to be sure, when looking back from some point in the future, that something else will not be deemed to have applied. However, this natural and understandable desideratum collides with the just as natural tendency to judge risks and above all dramatic losses in terms of results, and to make retrospective corrections. The organization, if it does not do so of its own accord or at the behest of its leadership, will then find itself condemned by public opinion to confess to its errors and perform the rites of mourning. But even then, the prevailing tendency is to abide by decisions once they have been taken; and the problem consists rather in renewing the legitimacy of the line one had followed[9] than in seeking new approaches for new problems. Instead

9 See the analysis of a particular case (chemical contamination of a build-

of setting new goals, one attempts to elucidate what had been wanted all along and to revise the memoirs of the system accordingly.

In this context it is not without importance that the way responsibility is allotted among the constituent units of an organization in the event of an accident is quite different from the way it is distributed when the organization assumes a risk. This naturally also applies in the event of disasters coming about entirely without the participation of the organization that then takes charge.[10] This is all the more true where the organization that caused the misfortune is involved or in combating it takes risks itself that have to be spread among the organizations and their proven procedures.

If developments that become apparent after the event not only raise estimated costs but also lead to the decision having to be regretted, what possibilities are open in reacting to precept? Probably the most harmless is ritual sacrifice. A person responsible is sought and found and laden with all the guilt. The ritual goes so far that someone who, in the official understanding, is personally entirely innocent, 'assumes responsibility' and leaves. The effects a change in leadership has on the performance of an organization cannot be investigated here.[11] In the special case of postdecision regret we can assume that the organi-

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ing) in Lee Clarke, 'Explaining Choices among Technological Risks.' *Social Problems* 35 (1990), pp. 22-35.

10 Thus a former government minister admitted to his surprise and helplessness when faced with the Chernobyl disaster: 'For the first time I experienced what regulations on competence, what formal systems of rules, what legal systems of rules within a state government mean in terms of power' – to quote Joschke Fischer, 'Ökologischer Realismus: die Definition des Unverzichtbaren.' In Joschke Fischer, ed., *Ökologie im Endspiel* (Munich, 1989), pp. 17-30 (25 f.). In another case, that of a heath fire on the area close to the boundaries of two rural districts, it is reported that the district fire brigades could intervene only after it had been ascertained that the fire affected both districts.

11 Research has hitherto come up with no conclusive results, perhaps because the question is couched in too general terms. This is also the case if the scapegoat mechanism is also taken into account. See, for example, M. Craig Brown, 'Administrative Succession and Organizational Performance: The Succession Effect.' *Administrative Science Quarterly* 27 (1982), pp. 1-16.

zation can in this manner avoid having to learn from the unfortunate course of events.

Learning would mean drawing conclusions from an isolated incident considered to be improbable, and that will presumably remain improbable. And it would mean altering the generally applicable decision making programmes. The consequences of this sort of learning process would probably be more thorough investigation, longer decision making processes, a tendency to forgo opportunities in favour of less risky decisions. Banks would doubtless be ill advised to reform their lending rules on the basis of isolated cases of insolvent debtors. Bad cases make bad laws. Organizations such as national and local authorities more strongly subject to the pressure of public opinion and political considerations are, by contrast, tempted to choose precisely this solution. Constant perturbation from cases in which something has gone wrong turns in the long term into programmed caution. The result may then increase risk for the system's environment: the risk of vain planning, vain applications, drawn out appraisal processes and above all the risk of not exploiting opportunities. The organization thus off-loads the risks it is unable to assume onto its environment. The organization's risk aversion becomes a danger for the affected parties in its environment.[12] To whatever extent this conjecture may prove its empirical worth, it remains unlikely that organizations assess their risks rationally in a sense to be considered optimal by the statistician.[13] The disaster occurs always as an isolated case, and the organization cannot establish a balanced attitude towards isolated cases. This inevitably brings up the question of what a society is letting itself in for when it progressively delegates the taking of risky decisions to

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12 See the case study by Janet M. Fitchen, Jennifer D. Heath, and June Fessenden-Raden, 'Risk Perception in a Community Context: A Case Study.' In Branden B. Johnson and Vincent T. Covello, eds., *The Social and Cultural Construction of Risk Selection and Perception* (Dordrecht, 1987), pp. 31-54. Wright, op. cit. (1987), even speaks of ultimate uncertainty that arises when bureaucracies are forced to decide on grave risks. What they themselves cannot predict makes them unpredictable.

13 This is at least also indicated quite unambiguously by empirical studies on the perspectives and behaviour of managers. For an overview see March and Shapira, op. cit. (1987).

organizations, moreover to organizations that reproduce themselves by means of decisions, and which have to incorporate the results of decisions into further decisions. In these circumstances there can certainly be no question of a calculable balance between opportunity and risk.

III.

Among the tried and tested methods for dealing with problems – tried and tested also in organizations – are factorization and differentiation. If it holds true for all organizations that the criteria for assessing decisions should not be amended retrospectively, the question arises of whether this is not precisely the point where a distinction ought to be drawn. Must what holds for a bureaucracy also hold for its leadership? Or is the topmost echelon subject to a different appraisal? There is nothing new in distinguishing between management and administrative levels – but we can think over what the difference means.

The leadership of a system is expected to provide decisions of greater scope. It has to handle the more significant external contacts. In all these respects making and not making decisions fall within their purview. Differences in confronting risk is another item that could be added to this list. We could postulate that what holds for management does not hold for all other levels; namely, that a risk not perceived or considered improbable discredits the decision in the event of loss occurring. Even if one can, when looking back, fully understand why the decision was taken, management also and in particular bears the responsibility for innocence. It is not a matter of justice but of success.

According to what empirical research there is on the subject, it appears that risk taking is indeed an role expected of senior management.[14] This expectation relates specifically not to optimal statistical analysis of the spread of possible results in terms of probability and positive or negative returns. It relates not at all to results, unknown at the point in time when the expectation is supposed to bite, but to the role itself. And this means not least of all that inconsistent expecta-

14 See March and Shapira, op. cit. (1987), esp. p. 1409.

tions can also be accommodated, for example in the sense of risk, yes – but please no losses.

Of course, such a conception cannot change the fact that the management of the system is also active within the system; that planning and policy-making take place only within the system, that is to say have to include themselves reflexively as factors among others, which – since they have to plan – have to be planned.[15] The communicative, cross-linking dialogue between superior and subordinate levels is not doubted.[16] The much debated question of 'management style' also remains unaffected. The leadership of an organization must of course observe the way in which it is observed; otherwise it cannot adapt to the conditions for successful communication. Regardless of all these insights provided by recent management theory, it remains to be seen what the difference really is between management functions and other functions – if we are not satisfied simply to cite the hierarchical relations between positions and the corresponding differentiation of competence.

Classical theories of management emphasized the ends/means schema. In these terms it was the task of leadership to provide for the realization of the values expressed as organizational goals.[17] However, this strictly asymmetrical determination of task in terms of hier-

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15 From the perspective of modern cybernetic theory see Heinz von Foerster, 'Principles of Self-Organization – In a Socio-Managerial Context.' In Hans Ulrich and Gilbert J. B. Probst, eds., *Self-Organization and Management of Social Systems. Insights, Promises, Doubts, and Questions* (Berlin, 1984), pp. 2-24, Rudolf Wimmer, 'Die Steuerung komplexer Organisationen: Ein Reformulierungsversuch der Führungsproblematik aus systemischer Sicht.' In Karl Sander, ed., *Politische Prozesse in Unternehmen* (Berlin, 1989), pp. 131-156.

16 On the political bureaucracy see Renate Mayntz and Fritz Scharpf, *Policy-Making in the German Federal Bureaucracy* (Amsterdam, 1975).

17 'The prime function of leadership is the purpose- and goal-orientated, inter and intra-systemic harmonisation of the business enterprise as a social system in its operative division of labour, for the purpose of achieving common objectives,' to quote an authoritative source; see article on 'Führung' in the *Handwörterbuch der Organisation*, 2nd ed. (Stuttgart, 1980), col. 734. This reference work incidentally ignores the problem of risky behaviour by/in organizations.

archy becomes progressively questionable as actual management comes to depend on circular structural models; and also under conditions where relevant information on changes in the environment no longer enter the system at the top but relatively low down – for example, at the sectional or departmental administration level, or in industry via the network of sales representatives. It should also not be forgotten that 'authority' is no longer based as it once was on class-based recruitment at the leadership level (which had of course never excluded failure, disappointment, rejection etc.). This, too, cuts the ground from under the feet of a hierarchy predetermined by analogy to social structures. All this suggests the need for reorientation, and the different attitude towards risk could provide a point of departure.

An organization that finds itself exposed to risk – and under modern conditions this will be the rule rather than the exception – could react by differentiating between leadership and execution. The task of leadership would then, also when seen from an internal point of view, consist in weighing up opportunities against risks and transforming the result into preconditions to be taken into account by the organizational machinery when making decisions. In fields where no opportunities worth mentioning occur, for example, in many areas of government administration, the problem would lie rather in discovering risks, in insisting that the decision making context be examined for even the most remote of politically scandalous negative consequences that would have to be dealt with. This does not constitute recommending a preference for safety first. It is rather a matter of seeing risks and providing security, of 'uncertainty absorption' in a sense of the term going beyond that of March and Simon.[18] And leadership achievement would then be measured not in terms of the extent to which risk is avoided but in the relation of risks seen and accepted to those not seen.

This particular exposure of the leadership level brings with it particular possibilities of dealing with risky decisions.

It is primarily an empirical question whether the leadership of organizations tends to make risky decisions itself or to delegate them (perhaps on the assumption that the organization and thus the behaviour

18 See James G. March and Herbert A. Simon, *Organizations* (New York, 1958), p. 165 ff.

of subordinates is under control).[19] At any rate management has, in addition to competence in deciding substantive matters, the power to decide on staffing questions, and it is in this area that risk perception among subordinate personnel is concentrated. Subordinates do not want to be dismissed and do want to be promoted. They place value on working conditions in line with their conceptions. In all these respects their expectations can be fulfilled or disappointed. In this sense Ortmann *et al.* identify 'a hierarchical order of two zones of uncertainty ' in enterprises having to decide, without adequate assessment of the consequences, whether or not to introduce computer-aided information and planning systems. Thus it becomes possible 'to transform the risk and transport it to another zone of uncertainty that is under control'[20] Secure in possession of the personnel manager's powers of hiring and firing, the leadership of organizations can depend on subordinates being risk-averse at their work. It thereby assumes the risk involved in choosing staff; but in this respect it will hardly be possible to criticize them afterwards for having disregarded alternatives. As far as this risk is concerned, leadership can thus feel relatively safe. Subordinates can pass the buck by shifting the risk upwards. The result will be that leadership must perceive its risk in success or failure, whereas subordinates perceive theirs in acceptance or rejection by the leadership.

In the real life of organizations there is probably more deviance from this standard model than there are exact realizations thereof. This is because participants behave 'strategically' in their relations to one another and reflect the attitude to risk of the other side, perhaps even exploiting it. However, it is precisely strategic behaviour that requires perceptible structural distinctions. It is only in a secondary

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19 According to a study by Kenneth R. MacCrimmon and Donald A. Wehrung, *Taking Risks: The Management of Uncertainty* (New York, 1986), p. 91, 23-38% of managers tend to delegate decision making regardless of the problem area.

20 Günther Ortmann, Arnold Windeler, Albrecht Becker, and Hans-Joachim Schulz, *Computer und Macht in Organisationen: Mikropolitische Analysen* (Opladen, 1990), p. 446 ff. (quote p. 447).

sense that, given good mutual knowledge of one another, psychological differences in risk perception and readiness to take risks might play a role.[21]

21 Scepticism about the explanatory value of 'a priori attitudes to risk' in organizational contexts is also expressed by Ortmann et al., op. cit. p. 446. Awareness of the unacceptability of such generalizations of quite different situations can in the meantime be regarded as the rule. See also MacCrimmon and Wehrung, op. cit. (1986), p. 99 ff.

Chapter 11
And Science?

I.

No one will deny that scientific research also runs risks and engenders dangers. Decisions have to be taken on research projects without knowing in advance what the results will be (if it were otherwise there would be no point in starting). The dangers of such an enterprise are also obvious. They arise from the circumstance that in modern society knowledge, once it has found its way into the world, can be neither kept secret nor ignored by other function systems as soon as it becomes relevant in their context. This is particularly true for the economy because of the pressure of competition. It also holds for the political system in the military field, and for the whole area of intervention and protection policy. It also applies, to mention other examples, to the medical, legal, and educational systems. Finally, there are risks inherent in scientific research itself, where, for example nuclear energy is in play or genetic engineering experiments are carried out.[1]

Familiar circumstances of this sort take on more visible shape if the binary coding of the system is emphasized. An increase in risk due to binary coding occurs in this context as well. The code generates an intrasystemic dynamic. All operations proceed on the assumption that others will follow. And regardless of whether research presents its concrete results as establishing the truth or proving the falsity of a matter, both values are once again at the disposal of all further operations.

Moreover, this distinction meshes in a complicated way with that of risk and danger. The risk of a research project lies especially in the

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1 This does not necessarily mean that science regards society itself as a laboratory. This is, however, the contention of Wolfgang Krohn and Johannes Weyer, 'Gesellschaft als Labor: Die Erzeugung sozialer Risiken durch experimentelle Forschung.' *Soziale Welt* 40 (1989), pp. 349-373.

initial hypotheses proving untenable, or even this finding proving impossible to determine with any degree of certainty. This risk comes to a dramatic head because science is expected to produce *new* knowledge and for this very reason assessments of the truth value of new developments diverge strongly.[2] It is typical to seek protection against this (but without any guarantee of safety) by designing research in any case to generate with a high degree of probability data worth reporting (that is to say data that are publishable and helpful in promoting careers). The refutation (or substantiated calling in doubt) of hitherto accepted knowledge can also count as a research success, especially if it has to do with knowledge of great theoretical import. These considerations on the subject of risk management within science modify the thesis that the risk of scientific research lies in not discovering the truth. If, however, we look not at individual projects but at larger research contexts, we realize that science cannot very well live by self-criticism or falsification alone, for this would rapidly exhaust all suitable stores of knowledge. In the long run sustainable truths must continuously be generated, and the risk run by certain research complexes or entire disciplines lies in not being able to do just that.

The danger science engenders consists in precisely the reverse happening; in its succeeding in doing so. Danger is engendered by truth, since no one (with the exception of science itself in the case of theoretically productive falsity) has any use for falsity. Only truth can be dangerous, due to the inherent obligation to acknowledge it, and to the fact that it works. As soon as knowledge is exploited, it can lead to damage or loss, which with hindsight makes it appear misguided to have exploited it in the first place. In the context of exploitation this represents a risk. But the production of knowledge itself – the goal of which is to gain knowledge, and which can incidentally assimilate insights into potentially negative consequences as knowledge – must be seen from another angle. In science truth can have only positive

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2 See Richard Whitley, *The Intellectual and Social Organization of the Sciences* (Oxford, 1984), p. 11 ff. For the purpose of bridging this problem, science creates a mechanism to allocate reputation, permitting it to observe and reward the value of new developments apt to stimulate research and sparing it from having to pursue truths ascertained with finality.

connotations. Any other attribute would so deform the operation that science would no longer be able to acknowledge it as scientific. Even potentially dangerous experiments or the construction of large-scale technological installations – the operation of which is needed to discover whether they are harmful and precisely what about them is so, and what protective measures can be taken – cannot be prohibited by science itself. However, science is – some say fortunately – not the only authority involved.

This quite normal uncertainty and riskiness occurring in autonomous research operations escalates in the fields of ecology and technological consequences. Science finds itself driven into territory it would never (or only in exceptionally rare cases) have entered for theory-controlled research reasons of its own. Problems occur here that do not arise within the framework of the research itself, so that it remains unclear exactly how such problems are to be formulated; which discipline they should be assigned to; what efforts, what time should be earmarked for the research; and whether it will be possible to gain useful knowledge within the meaning of the task set. Research does not operate in the headlights of its own vehicle; it is carried on in the lateral shadows.

This has also to do with the fact that the corresponding knowledge requirements are not even adjusted to technically attainable objectives; in other words they do not present themselves as extensions of available knowledge. It is not a question of constructing machines to perform better or more economically what can already be done. New problems tend rather to relate to the undesirable side-effects of technological realizations; or to matters perceptible only to the statistical eye, and where even the origin and factor composition are unclear. Science is faced with problems originating in an organized awareness that is not its own. For good reason it is confronted by questions that for equally good reasons it is unable to answer; it is concerned, as Weinberg has put it in a much quoted essay, with 'transscientific' tasks.[3] And where it does not cope, it is accused of failure.[4] This

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3 'Questions which can be asked of science and yet which cannot be answered by science.' Alvin M. Weinberg, 'Science and Trans-Science.' *Minerva* 10 (1972), pp. 209-222.

4 On this conflict see Arie Rip, 'Experts in Public Arenas.' In Harry Otway

merely confirms indirectly that science is an autopoietic system that can proceed only on the basis of its own respective state and can use only those structures (theories, methods) that it has produced by its own operations.[5] For this reason questions addressed to science from without must – if at all – be disciplined or discouraged by society.

Rules for dealing with uncertainties and risks, be they normal or imposed, are now sought under the heading of 'ethics'. We have, however, already seen that this is little more than a *nom de guerre* or has at any rate precious little to do with the experience philosophers have gathered under this name in their attempts to explain moral judgements. We shall therefore avoid becoming involved in this debate. A finding interesting for empirical research lies in the relationship between risk and danger. Under its own code, which it cannot abandon without losing its identity and which it can also not reject in the sense of a 'true or false, my life' statement, science operates in a manner that is both risky and dangerous. Neither of its two values permit it to evade the problem of uncertain damage or loss that involves behaviour having to be regretted (if one has survived). Only the form of attribution differs: *whether* a truth can be established is a question of risk. *If* a truth is established, it is – from the point of view of those affected (and they could be the scientists themselves) – a question of danger.

In this way the unity of the true/false code of science guarantees a practically inevitable coproduction of risks and dangers, and does so precisely on the basis of the contradiction of the value positions of true and false. If this is correct, it cannot be expected that risk calculation undertaken by science itself – with the aim of increasing the probability of research obtaining results and of avoiding vain effort – can be transferred to the account of societal rationality as a whole. The more probable validated research findings are, the more likely such risk calculation will contribute to the dangers that could arise from exploiting such results. Against this background, it is not surprising

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and Malcolm Peltu, eds., *Regulating Industrial Risks: Science, Hazards and Public Protection* (London, 1985), pp. 94-110. Rip recommends bridging this gap by means of an attitude of 'pragmatic realism'.

5 Greater detail in Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt, 1990).

that unfettered scientific progress is now regarded not without anxiety. Knowledge today may still be secure knowledge in the sense of the construction functioning reliably. But at the level of a general description of society, it has long since ceased to serve as an indicator for progress[6] – indeed, it scarcely maintains its role as a safety reservoir for the unpleasant surprises the future might hold for our societal system.

II.

Given these circumstances, we could conceive of a danger-orientated critique of science that refuses to be fobbed off with the reassurance that science controls its own decision-making risks as best it can. As far as the future is concerned, science produces a genuine semblance of knowledge[7] – and this is precisely what might be apparent to an observer of the second order. For second-order observation – observing coded observation by science to discover what science *cannot* observed in this mode – focuses precisely on the problem of uncertain future damage or loss resulting from a commitment that is to be regarded as positive. Its own danger is science's blind spot. But what would be the point of drawing attention to it?

The isolative differentiation of scientific effort in society has since ancient times (consider Aristophanes, theological attitudes of superiority or aristocratic rejection of pedantry) made it possible to criticize science from within society, but as far as the scientific system is concerned, from without. What science does can be both observed and described, and distinctions and criteria can be established in the process that are not those of science. The success story of modern science has, however, diminished the significance of such criticism. Science

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6 See as a representative of many of his contemporaries Walter Bagehot, *Physics and Politics* (1869), quoted from *Works* IV [Hartford (The Travelers Insurance Company) 1891], pp. 427-592.

7 Jean Paul speaks of an *'echten ... Schein* der Tugend'- in Hesperus, quoted from the edition of Norbert Miller, *Werke*, Vol. 1 (Munich, 1960), p. 803. This, too, even if not referred to as such, is an observation of the second order.

can afford to shrug it off; it does not depend on the forms of life and the distinctions advanced by such criticism. Instead, science criticism seeks forms that also suggest observation from without, while claiming to reform science or even itself to constitute better, 'real' science. The critique attacks both from without and from within. It hopes that it is itself a science or that it will at least develop into one.

This is true in a spectacular and prototypical way of the critique of political economy, which in the course of execution itself becomes political economy or the social theory of 'historical materialism'. Another example – equally radical but less influential – is offered by the phenomenological criticism of abstractions and idealizations in European science by Husserl and – in another version – by Heidegger. Husserl at least is motivated by the desire to establish the perspective in which he argues – that of transcendental phenomenology – as a strict science itself. In this respect Jürgen Habermas keeps his cards better covered; but his treatment of 'Technik und Wissenschaft als Ideologie' reads as if better knowledge were possible and attainable. More recent sociological research into science deals with a similar constellation, albeit in less critical tones (the criticism tends to address misguided theories of science) and with a distinctly heightened awareness of reflexive self-implication, and thus with a tendency to put paid to both science and criticism at one stroke.[8] To the extent that risk research has hitherto been able to establish its scientific credentials as an separate field, it has kept to the methodological standards of science, and has given little evidence of wider ambitions as a critic of science. This is surprising when one considers that many of the subjects dealt with concern science directly – for example, in the context of evaluating technological consequences, or in studies on the public reputation and competence of experts, scientists, or science itself.[9] In such contexts scientific research apparently also relates to science; but this continues to happen under the aegis of classical epistemological and methodological premises, which strictly forbid self-referential

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8 See, for example, Michael Mulkay, *The Word and the World: Explorations in the Form of Sociological Analysis* (London, 1985)

9 See, despite exaggeration, a *working off* of disappointment: David Collingdale and Colin Reeve, *Science Speaks to Power: The Role of Experts in Policy Making* (New York, 1986).

conclusions. Science speaks about itself in the third person. It notes that it is perceived as risky and dangerous – just as if this were none of its concern. For this reason it also sees no cause to ask whether risk research is not itself either risky or dangerous in, for example, supplying grounds for renouncing future research or at any rate submitting it, at the cost of autonomy for the scientific system, to political and legal regulation – and thus to restriction. This can lead to true knowledge (including true knowledge about the dangers of true knowledge) not being available when needed – thus leaving no choice open but to improvise or make 'impressionistic' decisions.

Meanwhile this ban on self-reference has lost much of its old stringency and unconditionality, however much it might still dominate normal scientific description, and despite the fact that for most research it is of no importance because of the subject matter dealt with. A number of developments have led to this relaxation. These include especially the passage from the theory of ideas (forms) to the transcendental subject, and from there to linguistic theory as the base concept of epistemology.[10] At any rate, for scientific research, language is an 'autological' object, i.e., an object that compels science – which has to use language – to make inferences about itself.[11] There is a parallel trend in the development of a general cognitive science, which examines how systems (cells, brains, machines, systems of consciousness, communication systems) work that process information under conditions of operative closure (that is to say without operative access to the environment), and which in so doing engender constructions of their own or 'own values', which provide them with sufficient guidance for their own reproduction. The old criterion of *adaequatio* or

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10 An introduction to this field is given in Ian Hacking, *Why Does Language Matter to Philosophy*? (Cambridge, England, 1975).

11 The concept of '*autology*' appears to have been coined at first to refer to words that apply to themselves (for example, 'brief'). For a generalization to the field of linguistics as such see Lars Löfgren, 'Life as an Autolinguistic Phenomenon.' In *Milan Zeleny, ed., pp. 236-249*; Milan Zeleny, Towards System: From Computation to the Phenomenon of Language, in Marc E. Carvallo, ed., *Nature and Cognitive System I: Current Systems-Scientific Research on Natural and Cognitive Systems* (Dordrecht, 1988), pp. 129-155 (129: 'autological predicament').

the 'correspondence' of internal and external circumstances is thus replaced by the purely temporal criterion of 'connectability' in the context of internal, highly complex, heterarchical, modular structures of information processing. This, too, demands an autological conclusion; for if this applies to cognition as such, then it applies to this theory as well.

There are corresponding developments in the natural sciences, with quantum physics leading the field, incorporating the observer himself in all statements on nature. Knowledge about the world can, in the physicist's opinion, be gained only by means of observing observers.[12] What decides on reality is then the type of cleft the observer makes in the world in order to indicate something as being something across a boundary, and to be able to distinguish between external reference and self-reference.[13] Thus the evolution of complexity, the mor-

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12 For a somewhat popular presentation see John P. Briggs and F. David Peat, *Looking Glass Universe: The Emerging Science of Wholeness* [s.l. (Fontana paperbacks), 1985].

13 At this point it is worth quoting a sort of summary with which Spencer Brown justifies at the end the fact that at the beginning of his form calculus he had nothing more to offer than the injunction: draw a distinction! In *Laws of Form* (p. 105) we read:

> 'Now the physicist himself, who describes all this, is, in his own account, himself constructed of it. He is, in short, made of a conglomeration of the very particulars he describes, no more, no less, bound together by and obeying such general laws as he himself has managed to find and to record.
>
> Thus we cannot escape the fact that the world we know is constructed in order (and thus in such a way as to be able) to see itself.
>
> This is indeed amazing.
>
> Not so much in view of what it sees, although this may appear fantastic enough, but in respect of the fact that it can see at all.
>
> But in order to do so, evidently it must first cut itself up into at least one state which sees, and at least one other state which is seen. In this severed and mutilated condition, whatever it sees is only partially itself. We may take it that the world undoubtedly is itself (i.e., is indistinct from itself), but, in any attempt to see itself as an object, it must, equally undoubtedly, act so as to make itself distinct from,

phogenesis of distinctions itself becomes an effect of cognition – or at any rate an effect of boundary-determined discrimination, not in principle to be distinguished from cognition mediated by the senses, by consciousness, by language. The generation of 'world' is thus described as an epistemic risk, which now tends to frighten itself in reflexive observation. Organization is apprehended as disorganization; the construction of order as multiplication of surfaces vulnerable to deterioration. And it is characteristic for the mood of this episteme, that words such as catastrophe or chaos become terms of mathematical and physical order, as if the more familiar terms used to designate order entrain too many presuppositions that have become implausible.

Thermodynamics – by no longer setting the time flow only in the direction of entropy, but also in the opposite direction towards a build-up of imbalances, of dissipative structures, of distinctions and of information – reveals the inevitability of a distinction between past and future arising for physical reasons. This makes it more or less predictable that cognitive systems will find themselves in situations where unpredictability itself is acknowledged and cognition becomes a risk.

If we ask which society allows itself to think in these terms and sees its own potential for self-assurance reflected therein, we hand over the problem of risk in science to the sociologist.

Sociology also shows itself to be accommodating in certain ways. It has had limited experience with reflexive conditions, for example, in the methodology of participating observation or in relation to self-fulfilling prophecies. Anthony Giddens concludes from the 'reflexive monitoring of action' – i.e., continuously feeding knowledge on conditions, contexts, and consequences of action back into the determination of the action itself – that knowledge in the social sciences changes the object to which it relates, thus constantly confronting itself with new situations and reflecting on this circumstance. We must therefore expect more research to produce not greater certainty but

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and therefore false to, itself. In this condition it will always partially elude itself'.

And we should add, the epistemic risk of all knowledge is precisely that it has to make something invisible. Among other things itself!

only greater uncertainty.[14] This will hold true *mutatis mutandis* for research into the ecological effects of the societal system where the results of research are known and exploited in the societal system. We can summarize such insights if we describe the phenomenon of modern science as a whole in terms of functional differentiation theory, where functional differentiation is to be understood to refer to the closed operation of constitutive systems on the basis of their specific functions and particular codes.[15] The autological conclusion then follows of its own accord. The scientific description of society becomes perceptible as description in society under the special conditions of the function system of science, and this intensifies the reservations on revision immanent in all science into general societal uncertainty about the reliability of scientific knowledge.

This shifts the context of risk research insofar as it makes use of sociological theory.[16] The theorem of system differentiation, itself a subject for scientific investigation, permits the scientific system to observe how it is observed by its social environment (or rather how its observation is observed by the social environment). The problem of risk and danger is shifted to the level of second- (or third- etc.) order observation. Here it is no longer a matter of 'practical questions' or of improving the rational calculation of risk or of preventing danger, but – as far as sociology is concerned – of insight into the structures of modern society and the consequences thereof. This by no means excludes a continued concern with risk calculation; and efforts in this direction are not discouraged by the experience that they cannot alter the structures of modern society nor their consequences. Placing the problem of risk in the context of social theory gives it *in addition* a *more radical* setting. It cancels out premises of the philosophy of science or even of epistemology with the status of dogmatic injunction or a priori statement by incorporating them. Searching for methodolog-

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14 See Anthony Giddens, *The Consequences of Modernity* (Stanford, 1990), esp. p. 36 ff.

15 See Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt, 1990).

16 And far beyond what, following Mary Douglas and Aaron Wildavsky, is discussed from the point of social and cultural dependence on risk perception and risk acceptance. See the bibliographical notes in Chapter 1.

ical guidelines themselves conforming to logical and epistemological conditions *can provide no release from either risk or danger.*

Being actuated and reproduced by social structures, this problem transcends the so-called transcendental epistemic conditions that one used to take as the concluding formula, as the final position in an epistemological theory.[17] Its secret model, logic, also refuses to cherish and fulfil such expectations, if by axiom it no longer understands something obviously reasonable but only those components of – some or other – calculus that cannot (not!) be proved in the calculus itself. One has consequently to adjust to recursively safeguarded system autonomy. The temporal and social forms of dealing with the future depend on the forms in which the societal system realizes its own differentiation. This applies especially to forms in which the social consequences of time binding are observed and described.

III.

Among the risks that science becomes aware of when observing itself is that of the abuse of scientific reputation – that of persons, that of statements with ostensibly scientific backing. This problem differs drastically from that of technological risk. A technology constructed on the basis of the deceptive use of scientific information – SDI has always been suspect in this respect – would not work. And that would be that. However, the public reputation of science also leads to science being searched for arguments – being regarded more or less as a munitions factory supplying both sides in ideological or political confrontations. A corresponding loss of authority has long been observed and regretted.[18] It has directly to do with the circumstance that risk has

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17 It is only as a precautionary measure that we repeat that this problem only recurs but finds no other solution if one transfers it from pure to practical reason, from epistemology to ethics. Even if one acknowledges that action, being more rapid, takes priority over cognition, this changes nothing in the structure of the social theoretical argument.

18 See Peter Weingart, 'Verwissenschaftlichung der Gesellschaft – Politisierung der Wissenschaft.' *Zeitschrift für Soziologie* 12 (1983), pp. 225-241, and for general political consensus problems Hans-Joachim

to be discussed in terms of probability or improbability, so that no one can be sure. At best one can only be sure that the other side in any controversy cannot be sure either. We have on more than one occasion emphasized that the future horizon of modern society must appear in the medium of probability/improbability. As a consequence, all that one can do in the present is to form an opinion about the future. Opinion corresponds, traditionally speaking, to rhetoric as a form of mutual influence. Science appears to escape this rule only by making use of statistical procedures. This requires enormous efforts in gathering data and calculating; and it must in the end prove to have been worth the trouble. Statements are thus produced that claim to be scientifically well founded. This might be perfectly reasonable if 'latent structures' that would otherwise escape attention can in this way be rendered visible. However, this does nothing to change the fact that, in the present, opinion is the only possible approach to the future – thus reducing participants in all social controversies requiring appraisal of the future to the knowledge-form of opinion, and bringing their efforts at convincing others down to the level of rhetoric.

The risk situation of modern society thus has a double effect. To reduce risk, greater demands are made for scientifically guaranteed security within the context of probability/improbability, thus forcing them to adopt the rhetorical mode. Science itself may behave reticently, but in so doing it exposes itself to criticism that it does nothing to promote its comprehensibility, or to face up to its societal responsibilities. If science responds to this demand, it risks having to appear

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Braczyk, 'Konsensverlust und neue Technologien.' *Soziale Welt* 37 (1986), pp. 173-190. A more exact analysis would, however, have to draw a careful distinction between the ideological-political use of science and its utilization in administrative or legal proceedings. In the latter case it is perfectly usual to demand more certainty and precision from expert opinions than they are in themselves capable of furnishing. 'Scientifically well-founded' statements thus become a construct of the exploitation system, vesting them by means of its own ascertaining procedure with an authority they neither have nor need in the scientific context of research. See Roger Smith and Brian Wynne, *Expert Evidence: Interpreting Science in the Law* (London, 1989). this need not necessarily involve science publicly losing face. it can therefore be assumed that this effect will occur only where public opinion begins to show interest in the questions of risk.

unsound or, at third or fourth hand, of presenting contradictory views on the same subject – although careful investigation reveals no internal differences of opinion among scientists. Science's risk increases in proportion to society's risk-aversion.

As sociologists of science have demonstrated, there are differing attitudes towards the certainty/uncertainty of the results of scientific research even in ordinary scientific controversies. The presentation of results stresses their reliability; criticism underlines the contrary. This is a normal process, and is almost automatically discounted when it is a matter of follow-up research. If, however, it is a question of an ideological or political statement, this habit of applying a touch of colour takes on another significance. If no direct falsification takes place, information is nonetheless omitted that would be necessary in a scientific investigation. For example, someone claiming to be the project director of a scientific institution writes that if a speed limit of 100 kilometres per hour were to be introduced for the autobahns in Germany, the emission of nitrogen oxide would fall by 32,170 tonnes per year (10.4%), while carbon monoxide emissions would drop by 135,420 tonnes (11.9%). What is not said is how these impressive figures were obtained (except by large-scale experiment), whether independently of the rate of norm-observance, of engine power and type, of vehicle streamlining, and so on. We learn only that the automobile industry is blocking this norm because of its export interests (although in almost all countries except Germany speed limits of this type exist).[19] Presenting such statements as scientific without giving an opportunity for scientific control is justified by the intention of reaching a broad public. But this public is then provided by others with different figures, and can conclude only that statements made by experts are unsound.

It is naturally not a matter of pillorying and preventing the abuse of scientific reputation. The suction effect of a 'society of risk' would in any case be too strong. Science can escape the risk of loss of authority – if our assessment of the facts is correct – only by inducing it itself. Authority, in the sense of representing the world as it is, ought not to be sought in the first place. If we obey the injunctions of the

19 I give no source.

philosophy of science, that is to say the self-description of the system, the term scientific can apply only to what can hold its ground under observation of the second order. In the above example this would mean that if one undertakes an investigation in a certain manner (to be stated), one obtains such and such data; if one does it differently, the resulting data will be different.

To quote Henri Atlan: 'Le désintéressement: prix d'entrée en scientificité.'[20] But this would provide too simple a picture, similar to the good old 'value neutrality'. Delimitation rules of this type, delimitation rules of all types, can now be resolved by the question: who is observing whom? This does not bring release from risk. Like observation of the first order, second-order observation remains risk in the choice of whom one observes and the distinctions by means of which one observes.[21] Thus the adequacy of second-order observation in dealing with a problem does not lie in the prospective security it can offer. We must rather see it in the greater degree of uncertainty that it generates and normalizes.

Today it is clearly no longer a matter of the sea battle of *de interpretatione* 9, no longer a matter of future contingent events that induced Aristotle to believe that judgements about them were also either true or false, but that one could not at the present moment make a choice between the two truth values. Thus it is no longer a matter of situations in which science was to be advised to abstain from judgement instead of assuming a risk. It is rather that the future as a whole has entered within the horizon of material uncertainty.[22] The best medium in which to describe them is that of the form probable/improbable.

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20 *A tort et à raison: Intercritique de la science et du mythe* (Paris, 1986), p. 201.

21 We register not without astonishment that even in the disintegration of socialism the state of the world is still being observed in the socialism/liberalism schema, as if it to profit from the blindness of precisely this schema in confronting the future.

22 An explanation is perhaps that in a complex society the material and the time dimensions of communicable meaning diverge more markedly, so that it is increasingly difficult to determine what at the present moment can be determined (although the world continues as before!). See Niklas Luhmann, *Soziale Systeme: Grundriß einer allgemeinen Theorie* (Frankfurt, 1984), p. 1111 ff.

This form is sensitive to decisions. The weight of its two sides alters in relation to what is decided. Decisions attempt (even if they claim to be pursuing 'goals'), to transform the probable into the improbable or vice versa. The past can be seen as evolution, as attaining a very high degree of probability or improbability as the point of departure for further dispositions.[23] The future vastly englobes the present in a cupola resting on the past – not in the form of continuity but in that of discontinuity. For this reason, the difference between past and future becomes the primary form in structuring time.

Society reacts to this situation by withdrawing to the level of second-order observation, to observing observers. We have noted above that this appears to be typical of all function systems. In everyday conversation, too, a sort of knowing perspicaciousness, a sort of complicity not bound by consensus seems to be on the increase. But we must leave that topic to specific examination. Acceptance of the insight that all truth depends on theory and method has become characteristic of science (and has long since been a familiar notion). We could also speak of 'constructivism'[24] or of reference to the outside world being replaced or mediatized by reference to the conditioning of statements on the outside world. This style will difficult for some to accept, it will be perceived as a devaluation of scientific statements where it begins to give shape to external description. But the same applies to other function systems, to the presentation of profit orientation in the economy, to form affectations in the arts or to the internal interest in conflict in the political system. Observation of the second order has hitherto also been practised more in the form of psychological or social depth-boring, in the form of revealing latent interests. More interest had been shown in exceptional situations, or in therapeutic exercises in the form of ideology critique or psychoanalysis. But now we can see that this was only a beginning doomed to failure

23 See Niklas Luhmann, 'Die Unwahrscheinlichkeit der Kommunikation.' In Niklas Luhmann, ed., *Soziologische Aufklärung*, Vol. 3 (Opladen, 1981), pp. 25-34.

24 See Luhmann, *Die Wissenschaft der Gesellschaft*, op. cit. p. 510 ff., 698 ff.

because of its own inadequacies.[25] There are clear indications that the autopoiesis of communication of the societal system is shifting progressively to the level of second-order observation and becoming dependent on it. And this seems to have to do with a society having evolved that has no choice but to run risks.

25 A good overview on 'ideology' is provided in Peter Dahlgren, 'Ideology and Information in the Public Sphere.' In Jennifer Daryl Slack and Fred Fejes, eds., *The Ideology of the Information Age* (Norwood, N.J., 1987), pp. 24-46.

Chapter 12
Second-Order Observation

I.

To conclude we turn to a subject that has occurred sporadically in almost all previous chapters, but which has been to the forefront particularly where we have been considering the relation between science and risk. Our own analysis operates at the level of second-order observation and at the same time ascertains that society itself already practises such observation of observers. What does this mean? And what are the consequences for a theory of modern society?

To reintroduce the subject let us recall some of the analyses we have already presented. However we approach the concept, we can speak of risk only if we presuppose that the person who perceives a risk and eventually assumes it draws certain distinctions, namely the distinction between good and bad results; advantages and disadvantages; profits and losses; and the distinction between the probability and improbability of their occurrence. Anyone who behaves riskily – who for example, takes risks in traffic or plays with guns – may do so as a first-order observer. But as soon as he considers whether to take a risk, he observes himself from the position of a second-order observer; only then can we really speak of risk awareness or risk communication; for only then do the distinctions typical for risk constitute the point of departure for the operation, taking the other side into account and not only reporting objects.[1]

Leaving that aside, we have to be able to draw a distinction between risks and other states in order to be in a position to observe them at all; and the risk concept gains in precision and definability only when we determine what a risk is to be distinguished from. In Chapter 1 the concept of risk was defined in terms of the distinction of

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1 With respect to the problems of a multivalue logic already becoming apparent here, see Elena Esposito, 'Rischio e osservazione,' MS (1990)

risk and danger, and thus reduced to a problem of attribution. However, this only led to the question of who decides on attribution with the possibility of attributing the decision on attribution in its turn. Moreover the preference for the distinction risk/danger implies rejection of the distinction risk/security, although we established that this distinction is used as well. However pertinent the arguments that might be advanced in favour of the one or the other, the fact remains that there are observers who choose one of these distinction in preference to the other.

The distinction between decision makers and affected parties also relates to the level of second-order observation. The decision makers observe that they are being observed. Each explains it to himself in terms of the presumed characteristics of those he happens to be observing. This serves to establish oppositions at the level of first-order observation – the 'capitalists', the 'greens', etc. But the occasion for opposition arises not from the facts but from the observation modes of the other side; it presupposes second-order observation.

As soon as one apprehends the function systems of modern society as binary coded systems, one is faced with the same problem. Codes are directive distinctions with which these systems search themselves and their environment for information. Thus a system can observe itself only if it determines which operations use its own code and no other. For this purpose the system has to observe itself as an observer. Moreover, coding presupposes programmes that can determine which of the code values – for example, 'true' or 'false' – is to be taken into account. But programmes, in this case theories and methods, can diverge. Such a system must therefore be in a position to observe what methods are employed to produce research findings, or what prices are obtained or not obtained in an economic transaction. The entire system operates at the level of second-order observation, and only secondarily – only for purposes of explanation, of description, of preparing for action – is observation of the first order with direct reference to the object activated once again.

This problem recurs at more concrete levels. It is not only that empirical content has to be logically and theoretically reconstructed, but also that practical orientation is required. Where experts are consulted – a much discussed and politically controversial proceeding – it is almost self-evidently a question of whether the expert as an au-

thority on (observer of) science pronounces his support for or opposition to a project, or of how he will answer some material question or other. Already at the stage of selecting experts, assumptions will be made about the sort of expert opinion to be anticipated. One does not have to be an expert oneself, but one must be able to assess the expert as an observer of his field. And this is impossible without a modicum of knowledge in the matter.

Even if it is a question of turning technological risk into a political topic, a need for decision making is generated that can be observed in different ways within the political system itself. The supporters of the project and its opponents will differ in the way they see it. Each will observe or have others observe the material problem itself, for example, the safety techniques in risky production processes; and will at the same time form an opinion on the quite different question of how the political chances stand and how different varieties of politicians will judge the matter – politicians who are themselves not free in their assessment , but under observation. For this reason they do not act arbitrarily, and can consequently be observed. Whoever is unable to perform in this second-order observation arena will soon be able to observe himself as someone who is no longer admitted to join in the game.

These excerpts from the analyses we have hitherto presented underline the scope of the problem of second-order observation. That it is a matter of observing observation is a formulation easily accepted. But this does not get us very far. Everything else apparently depends on clarifying what observing means, and how this operation can be applied reflexively, i.e., in relation to itself.

II.

For a considerable period now, second-order observation, second-order cybernetics, second semiotics and so on have been discussed, but apparently with reference to very differently understood base operations – for example, a mathematical operation (Heinz von Foerster); a very general, biologically determined concept of cognition (Hum-

berto Maturana), or sign use (Dean and Juliet MacCannell).[2] Gotthard Günther is concerned with logical structures that are suitable to determine and describe what happens when a subject observes another subject not only as an object but precisely as a subject, i.e., observes it in its role of observer.[3] Others see the problem as one of attributing observations to observers.[4] In the social sciences, similar questions are dealt with by means of a concept of observation lacking further explication (probably to be understood in a psychological sense) and primarily as a problem of method.[5] Second-order cybernetics naturally thinks in terms of operations of regulation and control.[6] Given such a variety of points of departure, we find it difficult to speak of a unified subject matter, let alone of a new epistemology. Nevertheless, certain developments are taking shape that are in strong contrast to what so-called 'postmodernism' has claimed to be the arbitrary exploitation of form and content.

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2 See Heinz von Foerster, *Observing Systems* (Seaside, Cal., 1981); Humberto R. Maturana, *Erkennen: Die Organisation und Verkörperung von Wirklichkeit: Ausgewählte Arbeiten Zur Biologischen Epistemologie* (Brunswick, 1982), e.g., p. 36 ff.; Humberto R. Maturana, 'The Biological Foundations of Self Consciousness and the Physical Domain of Existence.' In Niklas Luhmann et al., eds., *Beobachter: Konvergenz der Erkenntnistheorien*? (Munich, 1990), pp. 47-117, esp. p. 56 f. on 'objectivity in parentheses' and the sketch on p. 177; Dean MacCannell and Juliet F. MacCannell, *The Time of the Sign: A Semiotic Interpretation of Modern Culture* (Bloomington, Ind., 1982), esp. p. 152 ff.

3 See, for example, the paper 'Formal Logic, Totality and the Superadditive Principle.' In Gotthard Günther, ed., *Beiträge zur Grundlegung einer operationsfähigen Dialektik*, Vol. I (Hamburg, 1976), pp. 329-351. For a further development of this direction of inquiry see also Elena Esposito, 'L'operazione di osservazione: Teoria della distinzione e teoria dei sistemi sociali.' thesis, (Bielefeld, 1990).

4 See Rino Genovese, Carla Benedetti, and Paolo Garbolino, *Modi die Attribuzione: Filosofia e teoria dei sistemi* (Naples, 1989), esp. the contribution by Garbolini, which traces the development of the problem from the theorem of the impossibility of complete self-description.

5 See, for example, George W. Stocking, Jr., ed., *Observers Observed. Essays on Ethnographic Field Work* (Madison, Wisc., 1983).

6 See Ranulph Glanville, *Objekte* (German edition, Berlin, 1988).

Such confusion makes it advisable to define the concept of observation relatively formally, to place it, as it were, above the battlefield of opinions. Observation shall thus be understood to mean the use of a distinction to indicate one side (and not the other), regardless of which empirical reality the operation performs, so long as it is capable of drawing a distinction (and thus of seeing two sides simultaneously) and of making an indication. With George Spencer Brown we thus presuppose that distinction and indication form an indivisible whole, since only what can be distinguished can be indicated, and distinctions can be used only for the purpose of indication (which includes the possibility that will lead us to second-order observation: indicating the distinction itself with the help of another distinction).[7]

In these terms observation is the operative use of distinctions. If we wish to observe observation we must be able to draw distinctions between distinctions. However, it is not simply a matter of drawing up a list of the type: there are big things and small ones, blacks things and white, my house and other houses, and so on *ad libitum*. With such 'there ares' we remains first-order observers. We treat distinctions as objects, and we would always choose what interested us.[8] Observation of the second order occurs only when we observe an observer as observers. 'As observers' refers to the manner in which we observe. And this in its turn refers to the distinction we use to indicate the one side (and not the other). Or in Spencer Brown's terminology, it refers to the form underlying our observation.

This theoretical outline already contains more elements but also more difficulties than is apparent at first sight. In the first place, the base operation of observation is *itself* the guarantee for its own reality (and, as we shall see, is so in recursive cross-linkage with other observations). It draws its own reality not from *what* it observes not – in

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7 'We take as given the idea of distinction and the idea of indication, and that we cannot make an indication without drawing a distinction. We take, therefore, the form of distinction for the form': thus George Spencer Brown introduces his investigation *Laws of Form*, quoted from the reprint (New York, 1979), p. 1. We note that the concept of form conceals the paradox that consists in the concept of distinction being applied to itself as distinction between distinction and indication.

8 In which 'niche' one observes, as Maturana would put it.

the case of second-order observation – from the observer it observes. It thus does not depend on consensus, but has in itself the same reality value when it ascertains dissent. It is sufficient that the operation be actually carried out.[9] In other words it must succeed as an operation. But how is this possible?

In the terminology of Heinz von Foerster,[10] we would have to reply: the operation is not possible as an isolated result. It is constituted by the recursive calculation of calculations. The calculation of calculations produces intrinsic values of such stability that they can no longer be abandoned. The operation can of course fail, but then observation becomes lost in untenable perspectives. But how is this primarily mathematical formula to be interpreted?

It seem obvious to identify the intrinsic values of observation with the invariance of its objects.[11] In Spencer Brown's calculus the repetition of an indication leads to the 'condensation' of identity.[12] If, however, we wish to guarantee the stability of objects or identities, we must avoid confusing the different, historically never identical states of the operating system with its objects (even where these are states of itself that can recur). In other words, a recursively organized, anticipatory, and retrospective sequence of operations has to be able to observe itself as a system, to distinguish itself from an operatively inaccessible environment. It must be able to observe the sequence of operations as the drawing of a boundary, as the fencing in of what belongs

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9 On this 'constructivist turn of events see, for greater detail Niklas Luhmann, *Erkenntnis als Konstruktion* (Bern, 1988); Niklas Luhmann, 'Das Erkenntnisprogramm des Konstuktivismus und die unbekannt bleibende Realität.' In *Soziologische Aufklärung*, Vol. 5 (Opladen, 1990), pp. 31-58; Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt 1990), esp. Ch. 2.

10 op. cit. (1981,), esp. the contribution 'On Constructing a Reality,' p. 288 ff.; also in Heinz von Foerster, *Sicht und Einsicht. Versuche zu einer operativen Erkenntistheorie* (Brunswick, 1985), p. 25 ff. See also Heinz von Foerster, 'Erkenntnistheorien und Selbstorganisation.' In Siegfried J. Schmidt, ed., *Der Diskurs des Radikalen Konstruktivismus* (Frankfurt, 1987), pp. 133-158.

11 Thus von Foerster in the contribution 'Objects: Tokens for (Eigen-)Behaviours,' op. cit. (1981), p.273 ff. and 1985, p. 207 ff.

12 op. cit., pp. 9, 10.

to it and the shutting out of what does not. It must be able to distinguish between self-reference and external reference. The intrinsic value of intrinsic values – this is what constitutes the system: the system as boundary, as a form with two sides, as a distinction of system and environment.

At the same time this clarifies what observing an observer means. It means observing a system that for its part is carrying out operations of observation. Another system can be involved; but in the case of self-observation of the second order this can be the observer system itself. We are still leaving open the question of what sort of operation the system carries out. It may be a living system (for example, a brain), a psychical system (a consciousness), or a social system that performs only communicative operations. Thus observation of the second order can be performed on the basis of various operations. We cannot in this context go into greater detail about how this is possible. It must suffice to say that an observer system will always be involved and the intrinsic values of the recursive cross-linkage of second-order observations always presuppose the system form of observer. It is thus a necessary condition for observation of the second order that an observer be presumed to be able to draw a distinction between himself and his environment – regardless of whether, in any particular instance where he is being observed, he is observing himself or his environment.

We thus discover that second-order observation is always also first-order observation. From the vantage point of its own system it has to decide on reference to a particular system, that is to say it has to be able to draw distinctions between both systems and objects. We decide to observe a person or a political party, to observe the world economy or to observe the French legal system. We have to find our bearings in the world if we wish to direct our attention towards something in particular; for this purpose first-order observation suffices. And in many cases that will be the end of it. Second-order observation occurs only where we understand the system we are ourselves observing as an observer system – that is to say as a system that draws a distinction between itself and its environment, and which in the process produces intrinsic values and uses distinctions of its own to observe something within itself or in its environment.

III.

What help to us are these complicated and abstract reflections with their unclear logical basis when we are dealing with the topic of risks that are perceived and assumed – and controversially debated – in modern society?

They are particularly useful in casting additional light on the problems of risk communication. If the option exists, one can require that a distinction be drawn between first and second-order observation. At the level of first-order observation, participants observe one another as objects, and draw conclusions about the nature of partners or opponents on the basis of prejudices or perceptions, or on the basis of the communication of prejudices and perceptions. As Habermas would put it, this leads to a strategic orientation, eventually to a moral judgement triggering decisions on whether to attach importance to something or to disregard it. One sees *what* others see and forms one's own opinion on the same object. One lives with other observers in the same world and either fight or get along with one another. But is this also acceptable when dealing not with objects but with risks?

In second-order observation the primary question is which distinctions the observed observer uses to make indications, and how he does so. What does he regard as probable and what as improbable? Where does he locate the disaster threshold that makes him risk averse and causes him to reject all quantitative calculation? When mere liquidity problems arise? Or when bankruptcy threatens? Where his own life is at stake or already where some indeterminate person is possibly in danger? Is it important to him whether the desired advantages, which make a risk worth taking, accrue to the decision maker himself or to others? And is this distinction used reflexively, so that anyone who would like to induce others to internalize costs also sees that precisely this strategy has the effect of externalizing costs in its turn – so that it is quite impossible to reproach anyone for externalizing costs?

In the case of communication within organizations we could investigate whether participants can observe how they are observed, and whether this is equally true for both subordinate levels and for leadership. We could ask whether the attitude towards risk is a component of the respective role or whether it varies with success and failure. As

in older social psychological studies, we could ask about reference groups, i.e., we could ask by whom one prefers to be observed and by whom one fears to be observed, and which basic distinctions one attributes to these preferred/feared observers.

More examples could be cited. However, it is more important to come to grips with the communication problems to be dealt with when second-order observation has been established and can be expected. We must above all remember that at the level of second-order observation *hierarchy formation is no longer possible*, and that hierarchies switching to second-order observation, for example, in the relations between subordinates and leadership, are thereby relativized. (Hegel's famous master/servant logic had attempted to absorb this by attributing an interest in second-order observation to only one side, that of the servant, thus saving the hierarchy by means of this asymmetry.[13]) This cancels the possibility of forming an opinion about a system by observing the way in which the top echelon observes. Other, heterarchically coordinated reductions in complexity are necessary instead. Science, for example, has its publications and a highly selective reviewing system. One observes colleagues not as they observe but via their publications.[14] For the economy, competition has the function of a communication barrier, which nevertheless does not prevent the observation of observations operating via the market.[15] For the political system the same applies, with public opinion providing the mirror.[16] Only the family (or more broadly the complex of intimate relationships) represents an exception, and here everyone with experience in this domain knows what demands in the way of atten-

13 See Georg W. F. Hegel, *Phänomenologie des Geistes*, quoted from the edition by Johannes Hoffmeister, 4th edn. (Leipzig 1937), p. 141 ff. We could follow this up by noting that in the modern world there are no more masters. For a master is someone who can deal with things, but who has no need to indulge in second-order observation.

14 See Charles Bazerman, *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science* (Madison, Wisc., 1988).

15 See Niklas Luhmann, *Die Wirtschaft der Gesellschaft* (Frankfurt, 1988), p. 101 ff.

16 See Niklas Luhmann, 'Gesellschaftliche Komplexität und öffentliche Meinung.' In Niklas Luhmann, *Soziologische Aufklärung*, Vol. 5 (Opladen, 1990), pp. 170-182.

tion, circumspection, and refinement accrue from having constantly to observe how one is observed, and how difficult it is to steer communication away from the object level to that of observing observation while still managing to preserve the peace. Only love helps, and that not for long.[17]

The nature of modern society doubtless makes it seem obvious to presuppose second-order observation in all communication. This is true with regard to the attribution of communication to individuals, whose individuality in the modern view consists precisely in the individual observing himself as an observer and not simply living his life. But it is also true for large groups or for systems – for example, when we see educationalists tending to consider even politics as a pedagogical task; or when certain ways of observing are imputed to 'capital' even without reference to Marx. For sociological theory, such second-order observation is indeed an indispensable medium. Society itself has, however, already developed forms of immunization against the communication overload it engenders.

We could refer to such forms as the establishment of a basis for reaching agreement.[18] In greater proximity to our subject matter, Sheila Jasnoff speaks of 'regulatory negotiation'.[19] Where therapists

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17 On this subject see the papers 'Sozialsystem Familie' and 'Glück und Unglück der Kommunikation in Familien: Zur Genese von Pathologien.' In Niklas Luhmann, ed., *Soziologische Aufklärung*, Vol. 5 (Opladen, 1990), p. 183 ff., 218 ff., and with regard to wisdom and delusion in matters of love: Niklas Luhmann, *Liebe als Passion: Zur Codierung von Intimität* (Frankfurt, 1982).

18 Alois Hahn shows great insight in 'Konsensfiktionen in Kleingruppen: Dargestellt am Beispiel von jungen Ehen.' In Friedhelm Neidhardt, ed., 'Gruppensoziologie: Perspektiven und Materialien,' Sonderhaft 25 of the *Kölner Zeitschrift für Soziologie und Sozialpsychologie* (Opladen, 1983), pp. 210-233; Alois Hahn, 'Verständigung als Strategie.' In Marx Haller et al., eds., *Kultur und Gesellschaft: Verhandlungen des 24. Deutschen Soziologentages, des 11. Österreichischen Soziologentages und des 8. Kongresses der Schweizerischen Gesellschaft für Soziologie in Zurich 1988* (Frankfurt, 1989), pp. 346-359.

19 'Often leading,' she goes on, 'to a narrowing of the issues in dispute and a softening of positions in areas that still remain controversial' – in *Risk*

are involved they speak of 'prescriptions'.[20] In any case it is a question of returning second-order observations to the level of first-order observation. It is by no means the old naïvety of direct common belief in the world but of finding a solution to inextricable entanglements in communication. The world of second-order observation is opaque – both for the individual consciousness and for communication. One becomes involved in drawing never ending distinctions between distinctions, which always transport the other side along with everything that is thought and said. Thus magnified, the world constitutes a gigantic black box. And for precisely this reason, precisely when one has learned this and can impute the experience to others, it might become advisable to make at least some of the structures of interaction transparent, to be satisfied once again with first-order observation, with 'whitening the black box'.[21]

Just as in a politically corruptible bureaucracy – where one has to know someone who knows someone if anything is to be achieved – documents, files, evidence gain in importance, so it is with the establishment of a basis of agreement in a world that is constituted on the level of second-order observation. In the form of continuous extrapolation and variation of this base – the results of which can be directly observed – the system makes itself observable. It depends on the particular agreement reached – precisely because one knows that it is not 'the thing itself'. One learns language a second time. One learns again to distinguish between sign and signified – between what is available to all first-order observers and what can be observed as their observing. This distinction splits the so-called consensus together with all traditional demands for integrity, truthfulness and contractual fidelity. The system offers ways of operating that work because they are not taken seriously. The Romantics had incidentally already taught us this

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Management and Political Culture: A Comparative Study of Science in the Political Context (New York, 1986), p. 62.

20 See Paul Watzlawick, 'Verschreiben statt Verstehen als Technik von Problemlösungen.' In Hans Ulrich Gumbrecht and K. Ludwig Pfeiffer, eds., *Materialität der Kommunikation* (Frankfurt, 1988), pp. 878-883.

21 In the formulation of Ranulph Glanville, 'The Form of Cybernetics: Whitening the Black Box.' In *General Systems Research: A Science, a Methodology, a Technology* (Louisville, Ky., 1979), pp. 35-47.

with their concepts of 'circumspection' their 'irony', with their fairy world, their magicians, mirror images, *doppelgänger*, and sceneries indispensable if texts are to function as 'poetry'; but which ought not to be confused with what is essential – historically the first mode of observation, that which focuses on the written page. And we experience the same with the demand for communication permeating all society, with the demand to ensure staves of transparency in a world that has been rendered opaque by the practice of second-order observation, indeed in a world that has in a strict sense become unobservable.[22]

In a world the future of which can now only be described in the medium of probability/improbability, texts (for who knows how many readers), communications (for who knows how many observers), works of art (for who knows how many spectators) and prescriptions (for who knows how many patients) are at present the modes in which communication makes second-order observation available for observation of the first order.[23] This detour via 'the written form' (in the broadest sense) offers an alternative to direct observation of another observer. Such direct observation invites us to explain to ourselves why the other observer observes the way he observes. Affected parties thus develop theories of their own on the risky behaviour of decision makers and the decision makers produce theories on the protest behaviour of those affected by their decisions. One has experience in this field, and there are indeed possibilities to refine such explanations, to improve them, to render them more complex, and to make them more easily comprehensible. But this then raises the levels of complexity and opaqueness in the shared universe and certainly does not lead to consensus in the sense of a coincidence of system states.

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22 On the field of art see my contribution, 'Weltkunst.' In Niklas Luhmann, Frederick D. Bunsen, and Dirk Baecker, eds., *Unbeobachtbare Welt: Über Kunst und Architektur* (Bielefeld, 1990), pp. 7-45.

23 Nothing else can be meant when one speaks of the inevitable naïvety of reference to texts. See, for example, Bruno Latour, 'The Politics of Explanation: An Alternative.' In Steve Woolgar, ed., *Knowledge and Reflexivity: New Frontiers in the Sociology of Knowledge* (London, 1988), pp. 155-176, albeit with the too drastic call for 'abolishing the language of observers observing observers' (p. 175).

It is probably advisable to cultivate parallel and quite distinct communication channels that are able to function regardless of whether and to what extent participants can mutually reconstruct the universes of their observations.

Index