

Systemics: The Social Aspects of Cybernetics

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This essay will focus on the concept *systemics* according to Heinz von Foerster. I will interpret this term as central to his way of thinking and thereby attempt to replace the common labeling of von Foerster as a 'constructivist' or a 'second-order cybernetician' with the term 'systemicist'. This shall be carried out in three steps.

First of all I will give a short synopsis of the essential phases of development within von Foerster's publications and also discuss the advantages and disadvantages of his characterization as a systemicist in relation to other possible labels. This will take place within the framework of a rough clarification and reciprocal delimitation of the given terms.

In the second step, I would like to get to the roots of von Foerster's systemics. This will be limited to Gregory Bateson, especially because Bateson was - according to Foerster - the first to have thought „deeply into this systemics idea“ (Foerster/Broecker, 2002, p. 313), but also because Bateson's work was my own way to get acquainted with von Foerster.

The third - and last - point will be to pick out the question of the social aspects of cybernetics according to von Foerster. This will be carried out with an emphasis on the reception of von Foerster within the German-speaking world.

Science, Systemics and Second-Order Cybernetics

According to Bernard Scott, the contents of von Foerster's research from 1948 till the seventies can be divided into four larger periods (Scott, 1979, republished 2003, with additional remarks): The beginnings are known to have been in his work on molecular computation, with which he went to the United States in 1949. There he first met Warren McCulloch and consequently the entire *Cybernetics Group*, finally becoming a part of them. The second period is marked by various works on self-organization (esp. von Foerster, 1960), followed by a third period in which the interpretation of the memory as a computing process was introduced as a first, complete reflexive formulation of his theory (Foerster, 1970a). Finally, Scott mentions the fourth period as the works on self-reference, which von Foerster published in the seventies (for example: von Foerster, 1976).

Within this fourth period, the aspects that mark von Foerster's publications of the eighties and nineties already become apparent: (a) the linking of ethics and cybernetics (Foerster, 1973 & 1993a), (b) the focusing on the role of the observer (1972a, 1979 & 1998), (c) the development of the Socratic-like dialogical principle, in which first a theory of machines is connected to the problem of undecidable questions, and this then in turn linked to individual world views (1970b, 1984b & 1991), as well as (d) the academic-theoretical discussions which connect 'hard' and 'soft' research with society, ethics and epistemology (1972b & 1985), and (e) finally flow into the term of systemics, which we are following here (Foerster, 1997 & Foerster/Broecker, 2002). I therefore understand the thoughts of the 'late-period' von Foerster as his very own completion of a systemic world view.

The central meaning of the term 'systemics' for Foerster can be proven in two ways: on the one hand, it is something like a term of attack which he uses in order to protest against the classical

reductionistic 'science' paradigm. On the other hand, systemics - in contrast to 'constructivism' and 'second-order cybernetics' - is a term, which he at least uses without immediately distancing himself from it again.

On the relationship of systemics versus science: systemics as a term of attack. Foerster places his emphasis on the *dividing* that can be found in the term 'science' in English, Italian and French, due to the common Latin word 'scientia' (ibid, pp. 312p).[1] Science belongs to the same category as *schizophrenia*, *schism*, but also *shit* (cf. Foerster, 1997, p. 222 & Foerster/Broecker, 2002, pp. 312p). The classical term 'science' therefore only aims at a mere undoing, dichotomizing and taxonomizing. A reductionistic (and often enough mono-causal) way of thinking is at the core of this model, and it is no surprise that Foerster protests against this: Scientific reductions are necessary, but they are insufficient. The term "system" emphasizes the complementary aspect: the assembling and the unifying.

But why does Foerster not use the term 'systems theoretician', resp. 'systems theory'? I would assume that he wants to do without this term not only because it is also one of those terms, which have been used inflationary; and also not only because some systems theories - as for example those of Niklas Luhmann in the German-speaking area - can only vaguely be described as systemic (cf. Lutterer, 2003), but especially because a systems theory is, primarily, just a theory *about* systems, and thus addresses an inherent *distance* of the theoretician - a position, which, as is generally known, is not tenable anymore in second-order cybernetics. But does therefore only the otherwise hardly occupied term of systemic remain for Foerster?

Yet on the other side one finds his articles on the idea of self-organization, on constructivism and second-order cybernetics. Their systemic nature should be obvious, at least for self-organization and second-order cybernetics; but also for constructivism, especially if one considers the evolutionary theory of Jean Piaget, which Foerster mentions at various occasions. 'Systemics' would appear here to offer itself as an integrating bracket. To describe Foerster's theory as a mere theory on self-organization, would, on the other hand, be too vague, it would not comprise enough. Constructivism and second-order cybernetics themselves also encounter specific difficulties.

Constructivism has, similar to systems theory, become a term under which the various currents gather and which in return leads to many misconceptions, concerning among other things an immanent *ad libitum* aspect of construction which can be insinuated.[2] Foerster decisively protested against this label in a dialogue with Monika Broecker. Broecker even mentions that his claim „I am not a constructivist“ made her consider her own intended research on constructivist ethics for a long period of time as nonsensical (Foerster/Broecker, 2002, p. XV). Foerster elaborates on this point, that he neither wants to talk of 'ethics', nor of 'cybernetics' or of "constructivism", because direct intellectual access to the thoughts, which would interest him in all these areas had been obstructed by a far too large number of publications (ibid., pp. 3p). These terms carry too many associations, and the labeling itself obstructs an interaction. But of course, this objection can in principal be applied to any such term, including systemics.

The term "second-order cybernetics" suffers under the arithmetic difficulty, that with a nearly inevitable necessity someone will attempt to surpass it with a third or fourth order, perhaps even without ever having actually reached an understanding what the second order is made of (cf. Foerster, 1997, pp. 93p). It would probably indeed be better for Foerster's 'second order' if - as Scott suggests - this „non-trivial“ and „relativistic“ cybernetics concept was described as *reflexive* cybernetics (Scott, 1979, p. 12). Further developments within this area would then have to deal with the 'reflection of the reflection', which could indeed be quite amusing and clearly solely of epistemological nature.

To summarize these thoughts: Foerster introduces the term of systemics as a counter-term to science, in order to emphasize the connected against the dividing. The term systemics certainly can also be used as a formal integration of von Foerster's work on constructivism and cybernetics. But I freely admit that I do not believe that von Foerster would have attached importance to such a labeling, because it is also the labeling itself against which he protests. In contrast to constructivism and cybernetics, however, systemics would have the advantage of being a (so far) little used term. So it is maybe not the best term, but perhaps better than the others. Additionally, this term is so short, simple, says everything and then again nothing, that it perhaps might even have pleased the 'magician' von Foerster as 'his' label. Perhaps he might just have answered „So, you are a person who wants to describe me as a systemicist?“

A Systemic Dance

Bateson, according to Foerster, was the first to have extended a systemically oriented way of thinking. A special mention is given to Bateson's *Mind and Nature* (Bateson, 1979), and the famous formula of a *pattern that connects*, which can be found therein. Foerster gives a systemic answer to this systemic formula: After Bateson had asked for that, which connects, that, which lets us join thoughts; for the pattern, which is inherent in our interactive world, von Foerster plays a queer kind of a gender-scientist: *pattern* is from the Latin *pater*, father. Therefore, a rather masculine attitude towards these things would be associated by this term. He would rather like to think of a woman, and therefore the *pattern that connects* becomes a *matrix that embeds* (*matrix - mater - mother*). There had to be some kind of bed, or context, in which the various ideas could be a pattern (Foerster/Broecker, 2002, p. 314).

Through this supplementation of *pattern* by *matrix* von Foerster formulated not only a complementary thought, as he himself found out, he also indeed consistently thought out Bateson's systemics. He applied an idea of Bateson, which he had formulated in *Mind and Nature*, to Bateson's own formula. This is the term *double-description*. Bateson verifies in *Mind and Nature*, with the aid of a number of examples, that two (or more) descriptions are always better than one. The supplementing of one point of view with another produces an added value: Only the seeing with two eyes enables a perception of depth in the field of vision, the consultation of a second language of description gives an increase in understanding (Bateson, 1979, pp. 145pp).

But 'context' was also introduced by Bateson. Foerster used this term in his supplementation of pattern by matrix. He demands a „bed“, in which ideas can develop and become entwined. 'Context' occupies a prominent position in *Mind and Nature* but was developed much earlier (Bateson, 1955). [3] Without context, according to Bateson, there can be no meaning. But Bateson's term of context also explains the von Foersterian point of view that the world itself contains no information at all, but rather that it represents a human operation to transfer signals into information (Foerster, 1998, p. 98). Here Bateson is a little bit more radical: It is not even necessary to have the signals in order to gain information. Our expectations are enough: A letter that has not been written can be of great importance (Bateson, 1979, p. 51). The context – here the expectation – is crucial.

These parallels between Foerster and Bateson can be continued. There are a whole row of mutual publications, especially during the seventies, which can almost be read as a publicly led dialogue (but only for a chosen few, as they usually did not quote each another). Therefore, Foerster's „Perceptions of the Future and the Future of Perception“ (1972c) and Bateson's „Pathologies in Epistemology“ (1972b) appear almost as a set of intellectual twins. Bateson discusses the neurological and psychological limitations of perception in the sense of a private epistemology; Foerster gives a review

of several disturbances in perception under medical and epistemological aspects. Foerster criticizes basic scientific methodology with regard to evolutionary processes; Bateson reflects on the unity of evolutionary survival. Foerster calls out perversions of our language; Bateson propagates the corruption of the individual by the idea of power. Both refer the looming ecological and social catastrophe back to the human recognition, the „local epistemology“, as Bateson puts it (Bateson, 1971, p. 314).

Foerster's essay gains a special interest also due to the fact that he touches upon two thoughts, which Bateson picks out as a central theme some years later in *Mind and Nature*: the relation of process to substance and the ratio of quantity to quality (cf. Bateson, 1979, pp. 209pp, 53pp).

As one can easily recognize through these few explanations, the messages of the two are nearly inextricably linked with one another. *Pattern* and *matrix*, Bateson and Foerster dance the same dance. Bateson may have been the one whose systemic speculations were somewhat wilder, but Foerster was definitely the one who connected his creativity with a formal precision to a much higher degree and therefore perhaps even lived the connection of „loose and strict thinking“ (Bateson, 1941, p. 75) more consequently than Bateson himself.

Bateson may have been „the first“ - as Foerster modestly acknowledges (cf. also Scott, 2003, p. 146p). But it is Foerster who helps some of these ideas come to the breakthrough by applying terminological precision. The most succinct example surely is second-order cybernetics itself. Foerster can easily be identified as its ‘father’ in the sense of the creation of the term. But Bateson already formulates a clearly reflexive image of cybernetics during the first days of cybernetics itself within the framework of his communications theory. There, psychiatry is postulated as „reflexive science“ (Ruesch/Bateson, 1968, p. 253): Man „is not passive, but a participant in his own universe“ (ibid., p. 250). And, ironically, the term *matrix* emerges again within the framework of communications theory: "Communications thus has become the social matrix of modern life" (ibid., p. xiv). The matrix that embeds?

It is befitting to this dance, that Foerster and Bateson were - at least in American terms - nearly neighbors in the seventies. Foerster's famous Rattlesnake Hill lies approximately an hours drive away from Bateson's Ben Lomond, situated over Santa Cruz. But Foerster claims that they had rarely seen one another (personal communication, Sept. 13, 1996).

Reflexive Observers: the Social Aspects of Cybernetics

As it were, Bateson died in 1980 and Foerster had to continue his dialogue elsewhere. One year after Bateson's death he started a lecture at an international symposium on disorder and order with the statement that it is a „blemish“ that Bateson could not be there, and beseeched his spirit to stand by his side (Foerster, 1984). During the following years he refers to Bateson's ideas more often than before. At the same time, the great theme of his later thinking matured: the final transfer of reflexive theory to reflected practice as summarized in the maxim „I am part of the world“ (cf. Foerster/Broecker, 2002, p. 62).

Social aspects of cybernetics are emphasized by Foerster already towards the end of the 1970s as central for a reflexive cybernetics. The essential problems that have to be solved have grown to be of social nature:

... the gigantic problem-solving conceptual apparatus that evolved in our Western culture is counter-productive not only for solving but essentially for perceiving social problems. (Foerster, 1979, p. 284).

Both the ruling doctrine of causality and the delusion of objective truth prove to be hindering. *Social cybernetics* clearly is second-order cybernetics, as it includes the observer into the system (ibid., p. 286). This social aspect of cybernetics will be sketched out in the following with emphasis on the term of the observer and with the inclusion of German sociology.

As a reminder of the already mentioned division into four periods of development according to Scott: Foerster's works on self-organization, reflexivity and self-reference revealed their socio-political significance during the 1970s through their having been made fruitful for an analysis of the endangered social world. And at least for the German discourse it can be stated, that it was only the 'social' cybernetician and constructivist Foerster who received a wider public recognition. He only became known to a larger German audience after publishing the essay „On constructing a Reality“ in 1981. This essay appeared in an anthology of constructivist texts edited by Paul Watzlawick (Watzlawick 1981), which has been republished over a dozen times since.

A special role in the early German adoption of Foerster may have also been the apprehension within the sociological systems theory of Niklas Luhmann (Luhmann, 1984). Foerster's body of thought - particularly concerning the ideas of the blind spot, eigen-values and second-order cybernetics - was drawn upon. Did von Foerster therefore, qua constructivism and qua inclusion into a sociological systems theory, finally arrive in the German discourse? It would appear so, at least at a first glance, because in the following years central essays by Foerster were finally translated and thus made accessible to German readers (Foerster, 1985, 1993b & 1993c). Additionally, Foerster himself again began to publish in German, after an abstinence of decades.

A closer examination of the sociological apprehension of Foerster's cybernetics however makes the reader pensive: Luhmann does not take over Foerster's cybernetics without changing it. Furthermore he also does not make his own - and quite different - interpretation recognizable to the reader. This becomes most apparent in Luhmann's neologism of a 'second-order observation', which clearly follows Foerster's 'second-order cybernetics'. But von Foerster talks of the inclusion of the observer *into* the system, whereas Luhmann excludes this observer - labeled as a mere „psychic system“ - from his systems theory as merely being „structurally attached“, and he goes on formulating facts with his 'second-order observation', which are just an old hat for sociologists and social anthropologists: What is being observed is not more than the observation of *another* observer (cf. i.e. Luhmann, 1997, p. 281). The obvious reflection on one's own interference with the observed system is also completely lacking.

Another example for the alteration of systemic thoughts by Luhmann concerns the "blind spot" - Foerster's famous note, that "we do not see that we do not see" (Foerster 1979, p. 284). Luhmann supplements this with a further turn: "we do not see that we do not see *what we do not see*" (Luhmann 1991, p. 61, italics by me). But what does he win - or what does he lose with this? Following Dirk Baecker, he wins, and he wins a way into empiric research, which for Foerster and all other cyberneticians is forbidden by Wiener's verdict consisting in the impossibility of the application of long-term statistics for social systems (Baecker 2002, p. 38). But in what consists Luhmann's and Baecker's new way into empiric research? They both seem to *know*, what other observers can not see. But they do not reflect upon their own standpoint, at least not in their publications. If I understand Baecker correctly, they just start to tell everybody what society consists of - and what people do not see in it (ibid, p. 45). I for myself do not know, if they really know what they are claiming. Maybe it is just a further hitherto unknown step in common enlightenment that they deliver? Or is it just a even more sophisticated fallacy of "not seeing"? Of course I fear the latter. However, of course this is only

one answer to another question, which is in principle undecidable (cf. Foerster 1993a, p. 293). But these answers are crucial.

This is why one sadly has to note - at least in the point of these aspects of Luhmann's apprehension of Foerster's ideas - that a demanding and complex interpretation of social systems not only falls behind essential cybernetic insights, but also even behind the sociological developments in research itself. The reason may lie in Luhmann's controversial division of systems areas into biological, psychic, social and mechanical (Luhmann, 1984, p. 16), which appears heuristic, but then rapidly turns into a dogma. It therefore comes as no surprise that Foerster, after at first reacting benevolently, increasingly distanced himself from this adaptation of his thoughts (Foerster, 1992, p. 136 & 1997, p. 247 & 1999).

It would appear then, that the rendering of the social aspects of cybernetics is not quite so easy. Additional difficulties may also be found in the statement that von Foerster also described himself as a bad promoter of his own research (Foerster/Broecker, 2002, p. 217). This, for example, becomes noticeable in the fact that he only wrote essays but never a book. The monographs, which appeared in his later years were all the results of various conversations. On the other hand, they exemplarily illustrate the principle of dialogue, which he supported (cf. Foerster, 1997, Foerster, 1998 & Foerster/Broecker, 2002).

In the history of cybernetics, the adaptation of cybernetic knowledge to the social world has repeatedly hit upon high barriers, or has had to go through transformations, which make it almost unrecognizable. It is not only the later work of Foerster, which so far has to endure an existence at the fringe. His systemic source Bateson experienced the same tendencies in the seventies: Bateson was condemned as a New-Age-Apostle, his cybernetic communications theory and epistemology was either ignored or reinterpreted in major parts, as, for example, within the pragmatic communications theory of Watzlawick or the neurolinguistic programming of Bandler and Grinder (cf. Lutterer 2000, pp. 276-290).

It might be helpful to remember that the problem of social cybernetics was already studied by Norbert Wiener. Wiener was at first rather skeptical towards a corresponding application of cybernetic knowledge, because longer statistics in the social areas were lacking (Wiener, 1948, pp. 33p). Pressed by Bateson and Mead, but also by his own ethics, Wiener finally named the idea of a free market and the application of von Neumann's game theory from a cybernetic point of view as clearly recognizable social dangers. This objection of Wiener should, by the way, still be valid in today's age of a neo-liberal motivated globalization.

Wiener also drew the opposite consequences as Neumann in that age of the nascent Cold War: While John von Neumann became committed on behalf of the development (and also the use) of the hydrogen bomb, Wiener drew back from all co-operation with the US-Army and refused to do any further work with them: „I do not expect to publish any future work of mine, which may do damage in the hands of irresponsible militarists“ (as quoted in Heims, 1977, p. 156). And thus cybernetics split into a technocratic and a social-philosophical branch without any feedback between the two. The crux of this division of the early interdisciplinary cybernetics can be found in the fact that the technocratic branch dismissed the reflection on the act itself as pointless and mere speculation, and instead wrapped in a „technocratic steering- and control-euphoria“ (Baecker, 1993, p. 18). Intellectually, but also as the consequence of the application of cybernetic knowledge, this branch appeared virtually naive because it did not ensure the recursiveness between acting and recognition: The technical and social world to which we contribute through our action is the same world, which enables or prevents future actions. The social-philosophical branch, on the other hand, remained - cut off from mathematics and natural science - rather weakened and in a formal point of view underdeveloped. The

meaning of the 'change of sides' of the engineer Heinz von Foerster to the social philosophical branch cannot therefore be underestimated.

The problem of a far-reaching application of social cybernetics, as especially supported by Bateson and Foerster, remains in the fact that its attack on the stock of established strategies of action and philosophies of life was probably too broadly spread: A social cybernetics, understood as a synonym for systemics and second-order cybernetics, cuts its ties with established and popular scientific, political, social and philosophical ways of thinking. What it (so far) cannot, will not and should not - and perhaps never will be able to - offer is, however, a polished systematic alternative plan. Foerster and Bateson confine themselves in the end to the recording and questioning of the other's recognition, as well as giving indications to the possible change of exactly that. As good cyberneticians, they both know that the processes of change, which trigger a positive feedback per se cannot be controlled. That is why there is the renunciation of any large-scale outlines of theories, of the presentation of an encompassing social utopia. Social cybernetics does not want to follow any herd instincts in the sense of „Oh well, then - we better do, what Foerster tells us“, social cybernetics wants the return shift of responsibility to the human being itself: To where it still should belong (even in a world that is formed with technology). How does one want to *propagate* this, without producing such absurdities as in George Orwell's *Animal Farm*?

Foerster's concluding thoughts in his last book, the biographically structured conversational volume with Monika Broecker, are not by chance about the topic of *dancing*. By dancing with the world, all its apparitions are brought to light. And in this dance our ethics becomes realized and our world steps forth (Foerster/Broecker, 2002, p. 350). So it is clear, that social cybernetics cannot be pronounced - that is how one could paraphrase Foerster (and behind him Wittgenstein). We live in a continual and unrevocable tie with a *social* world, in defiance of various AI-daydreams and technocratic regulating fantasies. Cybernetics and our acting are always both in a social connotation.

Conclusion

This essay attempted a threefold approach to approach the topic of systemics as the „social aspect“ of cybernetics. In the first step, the term systemics was introduced and separated against other concepts and possible parallel terms. This was especially done because of the interest in lifting Foerster's thinking from its usual labeling. The admission is gladly made, that in the end it is not really useful to replace the one label with another. Favorable for the term systemic, on the other hand, is not only the empty content that such a term shows, but also that Foerster held an affirmative position towards it.

The inclusion of Bateson as a source for Foerster's ideas in the second part led to a very cybernetic result: Essential insights of Bateson can at least be paralleled against Foerster's statements. It was confirmed that Bateson - in comparison to Foerster - was „the first“, but at least from the second half of the 1960s and 1970s onwards (and this is the core time of the development of Bateson's systemics) it must be stated, that the two at least immanently referred to one another. The mutual parallels are too obvious, and a third author by which both of them could equally have been influenced cannot be recognized. Therefore a further analysis of the systemic concepts of Foerster and Bateson may prove to be very rewarding. It is well known, that a determined analysis of the *Cybernetics Group* (esp. Heims, 1980 & 1991) has only been attempted so far. But following the death of Heinz von Foerster (and therefore the last survivor of this certainly unique constellation of thinkers in various disciplines), such a work will sadly have to do without any contemporary witnesses at least of the early days of cybernetics. On the other hand, this might also make some things easier, as no single

perspective of any participant who survived the others can have the chance to write the history for all of them.

The third, and last part illuminated Foerster's systemics with regard to its social aspects and under the limitation to the German-speaking area. This was done under inclusion of the experiences, which had already been made by Norbert Wiener and Gregory Bateson. I am aware that I am showing tendencies of injustice towards further scientists who are working on a social cybernetics by not mentioning them. On the other hand, systemics as Foerster and Bateson saw it is clearly underrepresented in the scene of research and discourse. This can at least be said for the sociological orientated works in the German-speaking area. There, systems theory is widely equated with the works of Luhmann, a systemic oriented point of view appears to have sunk down into the areas of family therapy and organizational advisory services, but suffers from similar problems from time to time due to the therapeutic interest in interventions.[4] All in all, Foerster's and Bateson's systemics would appear to be a field that has not yet been developed in regard to its scientific-theoretical, social-philosophical and social-political consequences. A special reference should be made concerning the emancipatory, educational and democracy-supporting potential, which can be found in Foerster's publications, and perhaps also in the releasing and context-sensitizing effect that radiates from Bateson's papers. And through Bateson I would like to refer to my own contact with systemic thinking: as a path that soon led to the works of Foerster, which in turn referred back to Bateson and completed him in essential parts. It was therefore just too clear that the connecting aspect of these two authors and their mutual matter of concern had to be jointly theorized, as well as some comments had to be given, as to why there is a lack of rendering and further development of such a theory. That there is not just one but many entwined reasons for this lies in the nature of the subject.

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Footnotes

[1] The German term "Wissenschaft" (which translates into “the generation of knowledge”) on the other hand can be attributed with a principally more encompassing point of view.

[2] The connections between constructivism and some varieties of the post-modern area remain to be clarified within this context.

[3] It should be pointed out, that the terms *double-description* and *context*, which are used in Bateson's work are both based upon forerunning ideas, which were developed even before Wiener's cybernetics. A *double-description* is already applied in Bateson's social anthropological monograph *Naven*: A multi-perspective analysis enables a comprehensive image of a society of former head-hunters (Bateson 1936, esp. 29pp). The idea of context is based upon an analysis of behavioural patterns (*end-linkage*), in which Bateson reaches the conclusion that there is a bipolar connection in behaviour: Submission is not imaginable without dominance and the one can indeed turn into the other (Bateson, 1942).

[4] The probably most consequent and successful rendering of systemic theory in Europe can be found in the Milan School under Maria Selvini Palazzoli (Selvini 1988).