

Choices about Choices

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Abstract

In this contribution to the Festschrift devoted to Heinz von Foerster, choices are shown to be constitutive in processes of human self-organization. This is pursued along three dimensions that are seen as inherently connected: the epistemological dimension of reality construction, the communal dimension of dialogical closure, and the ethical dimension of autonomy and dialogical responsibility.

In order to exemplify his style of working as a mentor, Heinz von Foerster is portrayed in interaction, drawing largely on the author's experience.

As one concrete case of a far-reaching general approach, the paper brings out the implications of his way of thinking for cooperative software design. This leads to an epistemological view of the design process, to guidelines for communal work focussing on dialogue and self-organization, and to the ethics of systems design, which means taking responsibility for the choices made in design and the choice scopes associated with computer based systems.

Introduction

Contributing to a Festschrift devoted to Heinz von Foester is at once wonderful and difficult for me. His ideas had a great impact on my research as well as on my work practice, and have also affected my life in general. But this was not primarily the result of studying papers. Since he conveys important parts of his ideas through the way he interacts with people, I have learned more from our personal encounter, and my work with Heinz was embedded in a deep friendship that we have shared for several years. Thus, I need to write an homage to Heinz, and it will combine personal with scientific elements.

To begin with, my title is evidence of our interaction. The *emphasis on choices*, on increasing choices, is one of his basic themes, and using second-order concepts, i.e. applying concepts to themselves, is another. According to Heinz, we should always act so as to increase the number of choices. One basic choice is whether or not to accept the *other*, whether we opt for a monological or - as Heinz invites us to do - for a *dialogical world*.

In this paper, the focus will be on portraying Heinz in interaction. I want to do this by recreating the story of our meeting which exemplifies his style of working with researchers from the younger generations. As I see it, one of his key contributions in the present is his ability for helping others. For many people he has become a mentor, passing on the heritage of American Cybernetics, a school of thought he has shaped throughout most of his scientific life. In recent years, Heinz was tremendously successful in showing the relevance of his way of thinking for quite diverse spheres of activity. In my case, this pertains to understanding and facilitating cooperative design in software development. But this is just one instance of a far-reaching general approach.

Thus, choices come in on different levels here. I will take a close look at choices arising in the design of software. This leads to an epistemological view of the design process which I elaborated drawing on Heinz's ideas. But design is borne by people. So, facilitating group work is an inherent consequence of viewing software development as design. On the basis of my interaction with Heinz, I have developed and adopted guidelines for communal work focussing on dialogue and self-organization. The results of design are reified choices, enabling computers to become effective as auto-operational form. This points directly to the ethics of systems design, which means taking responsibility for the choices made in design and the choice scopes associated with computer based systems.

More generally, the emphasis on choice in Heinz's work unfolds along three dimensions that I see inherently connected:

- the epistemological dimension of reality construction,
- the communal dimension of dialogical closure,
- the ethical dimension of autonomy and dialogical responsibility.

In what follows, I shall bring out these dimensions, as they became manifest in the course of my encounter with Heinz. In keeping with this approach, I shall confine myself essentially to references that reflect our common work.

Starting a Dialogue

Let me start by recalling the origin of our friendship. I came to know Heinz in September 1987, shortly after starting a sabbatical leave in Palo Alto.

My background was in methods for software development. I had been brought up with the belief systems inherent in software engineering and had seen the claims associated with conventional methods fail in practice. As a result, I had re-oriented myself in Floyd (87) to the *processes of human learning and communication* involved. Then I realized that I needed to gain a deeper understanding of how insights arise between people (about software) before I could continue working with methods (for software development). In particular, I had discovered the relevance of systemic approaches from the cybernetic school. I had been deeply impressed by reading Bateson, Maturana and Varela and was just embarking on Luhmann's magnificent book on social systems. Moreover, I had profited greatly from meeting Stein Bråten who acquainted me with his ideas on socio-informatics and his dialogical theory of mind. But none of this seemed specific enough.

In order to get funds for my sabbatical, I formulated *Epistemological Foundations of Software Development* as my topic of research - a phrase, which stood for a bunch of questions. Also, I had set out to plan an interdisciplinary conference on *Software Development and Reality Construction* which was to take place in Germany in fall 1988. With this double concern in mind, I had six months to spend in the San Francisco Bay area.

I followed a hunch when I looked for Heinz. I knew little about him, only that he was standing behind some of the authors I read at the time. I was intrigued by the fact that he is Austrian like myself, and that he lives in my much beloved Pescadero near the Pacific Ocean. - So, I looked up his number in the phone book, called him as a complete stranger, and first reached his wife Mai. A little embarrassed, I introduced myself with my research topic, to which she replied in a matter-of-fact tone: "You have reached the right address for this. In fact, the only address in the world." - Then she continued: "You must meet my husband", and soon I was invited for lunch at their home on Rattlesnake Hill.

I would like to commemorate with gratitude the wonderful hospitality bestowed by Heinz and Mai on me and my daughter Barbara. It was the setting which gave rise to everything else. Driving through deep forests and along the gorgeous coast, into the quiet valley and eventually up the steep hill, was like leaving behind the banalities of everyday life. Heinz met us at the car and led the way to their beautiful house, all surrounded by sloping meadows, lush woods and thorny scrub. The spaciousness of the living room, the terrace with its superb view, and the intimacy of the dining room revealed themselves and welcomed us. Mai offered a delicious meal with relaxed grace. Later, we had a marvellous walk through the wilderness of the hill.

The atmosphere was one of warmth and of intense conversation. It encompassed many spheres of life, of cultural and intellectual interests: the places dear to Heinz and me, our family backgrounds, who had mattered to him when he was young, how he had become a magician as a school boy, what had been the important stages of our lives. He told me about his cultural involvements, of friendships with outstanding artists and scientists, of the decades they had spent in Illinois, how they had come to Pescadero and built their house with their own hands. And, quite naturally, Heinz's basic stands on philosophical issues entered also, it became clear that we shared a common love for the I Ching, and so on. Everything was included to set the stage for our dialogue.

So, what are you interested in? He asked me eventually. By that time I had realized that he had no ready made answers for me. In fact, I had some troubles explaining my questions to him. Yet, he was willing and able to relate to them in a remarkable way. Heinz was a wonderful partner in dialogue and made me feel completely accepted and at ease.

I was enchanted, and I have seen him enchanting many others in a similar manner since then. Heinz and Mai live in a remote place, far away from any major human dwelling, and yet, after my first visit, it was difficult to find a time for subsequent ones - so many people from all over the world would make their pilgrimage there. Nevertheless he managed to stay in touch with me as well. I realized soon that I was becoming part of a network, with Heinz as its pulsating center, bringing people together, making them glow in his warmth and radiance, and enhancing their chance to interact.

Heinz has expressed the core of what he stands for in the *Significance*-part of his famous paper "On Constructing a Reality":

"... neither me nor the other can be the center of the universe. As in the heliocentric system, there must be a third that is the central reference. It is the relation between Thou and I, and this relation is IDENTITY:

Reality = Community." (von Foerster (84), p. 62)

If, what he lives, is what his theories suggest, they may be worth studying, I thought.

Choices in building insights

Making sense of Heinz's papers was not an easy task for me. They tended to be about subjects far away from my interests. Pages and pages about nerve cells and synapses, and at the end a few sentences that I found important. I could not see how the conclusions he draws were connected to the substance of his papers, or why it was necessary for him to recur to ways of thinking borrowed from physics or neurobiology in order to deal with human affairs. For example: what has the principle of relativity, which he brings in just before the sentences I quoted above (von Foerster (84), p. 61), really got to do with adopting or rejecting a solipsistic attitude? Is it legitimate to jump from the nerve cell to understanding human thinking and acting, apparently using the same concepts? What about the vast body of philosophical thought he seems to sweep under the rug? Why does he use machine notions at the human level? Does this not mean denying the richness of human reality? I did not understand his style of recursive thinking. His insistence on paradox seemed like an intellectual trick.

In talking with Heinz, however, these difficulties did not arise at all. He had a marvellous way of relating directly to my questions and of giving me small hints that would enable me to take my next step. I started to notice that he did not rely on any comprehensive theoretical framework, but rather *he had invented a set of epistemological tools*, along with techniques for using them, all related to the idea of double closure. Now, I was invited to get to know and learn to use these tools. The task was not one of learning *what* but of learning *how*. Heinz tends to state his points as aphorisms in simple terms that anyone can understand. And through his guidance, I began to see how I could relate these figures of thought to my field of interest.

What I did was not like adopting an encompassing theory. In fact, I became increasingly impressed by how Heinz avoided referring to any fixed theoretical framework. Rather, the emphasis was on showing theories as emerging, shaped by the choices made by their authors, tried and used by others, and found to be more or less useful.

I was faced with learning strategies that enable novel ways of thinking and make the topic of investigation look in a different light. Some of these had been developed by Heinz, others by his fellow Cyberneticists. Of crucial importance was the specific distinction made between ontology and epistemology. He was not concerned with saying what things are, but only what we can know about them. From Gregory Bateson he took the idea, how *explanatory principles are invented*, from Ernst von Glasersfeld the contention that cognition was about *fitting* rather than matching reality, and that *viability* was constitutive in acquiring knowledge. "Draw a distinction" he would quote George Spencer Brown. And he showed the close connection between his ideas and those of Gordon Pask, of Humberto Maturana, Gotthard Günther and others who had been with him in Illinois. And, and, and ... ! - I had the feeling that he was surrounded by a large number of thinkers. Many of them were or had been his friends, others, like Wittgenstein, his intellectual ancestors. And in working with Heinz I was introduced to his interpretation of their ideas as well.

As I became acquainted with these ways of thinking, it was easier for me to appreciate his papers. For example, "constructing a reality" is an epistemological statement, not an ontological one, thus "a" reality rather than "the" reality. The notion of the non-trivial machine made sense as an explanatory device, not as a statement about what people are. Applying a concept to itself helped to show the distinctions we were after in a more poignant manner and thus to bring out the living dynamics involved. Heinz also introduced me to *self-organization as a self-referential concept*, inherently pointing to *my ability of organizing myself*, and as a result allowing me to make more subtle distinctions about my topic of concern.

Often he referred to the choices involved in making concepts: "I always ask myself, what can I do with this concept". Perhaps it was unfortunate that Shannon called his famous logarithm "information", he suggested at one time, a different name might have been less misleading. In a similar manner, he dealt with his own concepts. "You know, I had to give a lecture to architects. So, I chose the term 'constructing' a reality. I thought, they would like it. Do you think I should have chosen a different term?" And he proceeded by telling how Maturana used the term "bringing forth" reality, and so on.

Heinz always stayed concretely with the subject in hand, relying on as few concepts as possible and making no assumption about the rest of the world - unless he made the assumption explicit as the stand he took on an in-principle-undecidable question. For example, he never used the term "system" in a theoretical sense when talking with me. It was not necessary to consider openness or closedness as global system properties, all that mattered was local operational closure in the process. This way of proceeding is very flexible, as it can be accommodated in quite different theoretical frameworks.

We would talk about the distinctions I had in mind, what the implications of a potential distinction would be, what connotations would be associated with the concepts I might choose, and how they might lead the way to different forms of practice, if taken up in the community.

I started playing with the elements of Heinz's thinking and relating them to my questions. What exactly can we embody in computer programs? How do they relate to the world? How do they come about in human processes and how are they embedded in human contexts? How can we understand software development as a cognitive process amongst human beings? How do programs become effective in use? What theoretical foundations are helpful for understanding this? And how can they provide guidance in practice?

There was a huge gap between what I eventually understood and the traditional teachings of computer science. I would like to sketch here, how I came to use Heinz's ideas. In doing so, I shall refer to some of his aphorisms that became relevant in our interaction.

- Let the process become the object •

Focussing on the process was natural for me already in Floyd (87). Unlike the mainstream of my field, I mean the actual situated process unfolding in time, the activities carried out by the people involved and the communal learning that arises through their interaction. This process is unique, borne by those involved in the situation.

- Include the observer in the observation •

In computing, we tend to start from supposedly given problems. But in the light of constructivist thinking, problems are descriptions, invented by observers. Thus, in software development, we *construct the problem as well as the solution*. There is no problem solving without problem setting. And the solution is chosen by the participants so as to be viable with respect to their concerns. We make choices in selecting features to be incorporated in our models, or to be abstracted from.

- Only in principle undecidable questions we can decide •

I had difficulties in understanding this point and using it in my context. Heinz tends to illustrate this concept by referring to fundamental unknowables, such as, how the world came about. But in our daily lives we are not faced with questions of this kind. However, in Von Foerster, Floyd (92), Heinz continues "all other questions are already decided by the framework in which they are asked". I can relate to this. In my view, in-principle-undecidable-questions also arise in a small way. They pertain to observer-bound differences in opinion and judgement that cannot be reduced to a common


ground - unless we change the framework in which they are asked. Thus, in software development, we have to be concerned not only with the questions that arise and the stands to be taken but with the frameworks that give rise to them.

This is how I eventually expressed my resulting view:

"For example, a software developer analyzing an organization with a view to proposing a software system to support its information processes, is often encouraged to start from the 'real world', conceived in terms of the entities and the actions constitutive of the information flow in the existing organization. These are supposed to be 'given', while the software developer's task is to analyze, to abstract and to elaborate a correct model that can be manipulated by the computer. While this may be difficult to do, the task itself - *discovering* the correct description - is supposed to be clearly defined and independent of the software developer as an individual. Also, his or her responsibility in carrying out this task is restricted to matching the real world in the model with the greatest possible care.

This picture changes drastically, when we acknowledge our active role in bringing about what we hold for real, which is the key to constructivist thinking. The emphasis now is on the *observer* constituting the way he or she sees reality and *inventing* a suitable description. Thus, the software developer is portrayed as making *choices* in an open situation, where there is more than one possibility." (Floyd (92a), p.16)

The key notion for me was *design*, which I eventually came to see as a web of distinctions and decisions in an unfolding design space, spanned by the views of all participants. My view of design is described in detail in Floyd (92b). It also contains an adaptation of Heinz's recursive figure of cognition being computation folded back on itself: What would "design of", applied recursively to itself, converge to, what was the eigen-value associated with design? I settled for *quality*. Thus, I propose the figure


$$\text{Quality} = \text{Design of } \underline{\hspace{2cm}}$$

Quality, here, is considered an emergent phenomenon, resulting from self-stabilizing processes of making and evaluating distinctions and decisions in design.

Heinz commented on the manipulative connotation of the term design: "By *my design* I do this or that at *your expense*". So, I decided to use the notion of *Dialogical Design*, in which the perspectives of all participants enter and are respected.

Adopting this approach has an enormous impact on the practice of software development: Rather than trying to emulate linear top-down development, it will lead to cycles of design decisions, their evaluation and revision, as for example in connection with prototyping. Rather than fixing one view early on, it will suggest bringing out and coordinating the variety of views. Rather than dividing the work right away, it will emphasize the importance of a shared understanding to be developed and upheld by the participants. Rather than aiming for software development to be independent of the people involved, it points to focussing on the situated process and on making this more transparent.

Computer programs embody *operational form* in their application field. We invent operational form in the course of software design. But, in doing so, we also invent choice scopes for the users interacting with the working software. When executed, programs become effective as auto-operational form, enabling or preventing users from making choices. In an age where we increasingly populate our world with computer based systems, it becomes of paramount importance to understand the interleavement between operational form and the living process shaped by it. In order to enhance our possibilities for human choice we need to assess how making available auto-operational form interferes with choice scopes in different areas of human practice.

Choices in communal work

Clearly, the view of design sketched above rests on processes amongst people. How can we facilitate such processes? I had become convinced that dealing with the contents only, while leaving out of consideration the people involved and their relationships, was counterproductive even in quite technical fields of work. Using Gregory Batesons notions, I talked about "Mind" arising in groups. Heinz not only helped me understand the dialogical, self-organizing nature of the processes involved but also provided encouragement in changing my work practice. This came up first between us when discussing cooperative work in software development. But much more important was the conference on Software Development and Reality Construction, documented in Floyd et al. (92), in which Heinz played an essential part.

To portray Heinz, allow me to recall some of my memories again. As soon as I had told him about my conference plan, he immediately took a hand in it and made it his conference as well. He encouraged me to "perceive that it was to become a self-organizing system, a process that would establish new links, may they be personal, social or conceptual; that would generate dialogues during the conference, generating in turn seminars, meetings, groups, ..." (von Foerster, Floyd (92)). Think in terms of nucleization, he suggested. See the participants as the seeds from which everything will proceed.

So, to begin with, we formed a nucleus of four organizers and other committed participants, most of whom were our friends, who helped us illuminate our theme from different angles. Eventually, we focussed more and more consciously on the concordance of form and content. The way the conference was conducted should exemplify the kind of process we were after. The key to the whole thing was to *see the conference as a network of potential dialogues growing out of the preparatory process*, borne by all participants, and enriching one another on a mutual basis.

As organizers, we felt responsible for setting the stage for this and for using all means available to us for promoting dialogue. This involved understanding our own role as process facilitators, creating and maintaining an atmosphere where everyone would feel accepted and at ease.

Of course, I was very nervous before the conference opened. We were about to take risks. I had not seen Heinz for several months then, and this was my first meeting with him in Europe. I picked him up at the airport late at night, he had been travelling for

fourteen hours and arrived wide awake and full of zest. We had a marvellous time renewing our friendship, exchanging news and laughing together, and soon my fears had almost gone. Heinz radiated confidence. He and I were to open the scientific programme with a dialogue on self-organization and software development, retraced in von Foerster, Floyd (92). We had no opportunity to rehearse it - I had just sketched how we might proceed. "You are self-organizing me" he said and added, how he could stick very precisely to the times, since he had been a radio speaker in his young days. And he acted like a virtuoso. I became acquainted with his enormous vitality, with his precision in giving talks, with the love he emanates.

Throughout the conference, I felt supported by Heinz in the most remarkable way. He seems to give himself completely to one person, while keeping track at the same time of all his other involvements. This meant communicating intensely with many of participants and yet acting consistently as my partner in organizing the conference as a whole. And at the background, there is always Mai. Ever so often he withdraws to telephone with her, as if recurring to a lifeline connecting him with his fundamental dialogue and anchoring himself on Rattlesnake Hill. It seems that Heinz draws energy from one dialogue in order to immerse himself in an other, and that love shared with one re-inforces his ability to involve himself with the other.

I see this ability of Heinz as the result of a life-long adoption of two principles he has formulated

- See yourself through the eyes of the other •

This is the principle of *dialogical closure*. The important thing to understand about the dialogical attitude promoted by Heinz is that it is neither egotism nor altruism, instead it rests on "What is good for you, is good for me". Thus, the point of reference is the relationship. The other principle is

- I am not a human being, but a human becoming •

Becoming stands for change, development and growth. In connection with dialogical closure, this is based on mutual enrichment through my interaction with the other.

What are the conclusions of this to be drawn for group work? Well, this involves caring about choices in *organizing projects*. Management takes on a new form: rather than imposing rules, the idea is to facilitate a process of self-organization. As group leaders, we are mainly responsible for the rules of the game and for setting up a climate, allowing the others to become creative and interact. We are also responsible for reflecting the process. In order to promote this in my environment and in my teaching, I have formulated what I call *gestalt-forming project techniques*

Establish and renew a common platform

Develop and reflect a project language

Articulate and cross individual perspectives

Include and interrelate all participants

Bring out and coordinate variety

Adopt and exchange project roles

Give and take constructive criticism
Create and uphold a milieu of mutual trust

While these principles are easy to state, they are hard to follow in the midst of time pressure, lack of communication and conflicts of interest. However, constant practice and common reflection bring about profound change with time. Taking all participants and their concerns seriously, leads to unfolding different dimensions of relating to the topic and allows the results to be included in the process. Thus, we can promote the emergence of rich structure and of living quality.

Choices in human becoming

Ethics is always implied in human action, and in particular, in the conduction of our work. Heinz deals with ethics in a specific way. His position is directly related to the notion of autonomy and double closure. I see several elements as constitutive of his approach:

- avoid explicit treatment of ethics,
- emphasize ethics as self-referential,
- promote choices about choices.

Drawing on Wittgenstein, Heinz holds that ethics cannot be articulated, hence the term *implicit ethics* is sometimes used to circumscribe his stand. Instead, he refers to ethics indirectly, through her "sisters", as he put it in von Foerster (92), metaphysics and dialogics:

- *Metaphysics* comes in by the stands we take on in-principle-undecidable questions. Only those we can decide. And we have the responsibility for our choice.
- Accepting or rejecting the other is connected with such a choice. And thus *dialogics*, living in the reality of Thou and I, is the basis for our actions.

Heinz is suspicious of explicit norms. Any norm, any ethical command, is *self-referential*: it says something about whoever issues it. Heinz does not base his approach explicit norms, whether they come from authority or through social conventions. His aim is not to constrain human choice, but to give an orientation for making choices. Thus his ethical imperative

- Always act so as to increase the number of choices •

Let me first consider the relevance of Heinz's stand in my context. We use his imperative as an orientation in design. Of particular interest are automated choices encapsulated in operational form. In automating a choice, the designer anticipates the class of possible uses. There are two extremes: model all possible actions (as operational form), or leave the use context open but offer a repertoire of possible operations to use as needed. In design we create action spheres for a quasi-autonomous technical device. How do we allow it to interfere with human affairs?

Increasing the number of choices is a powerful guiding image, but at the same time, it lends itself to criticism. Whose choices are we supposed to increase? Are all choices equally worthy of being allowed for? Should we not sometimes decrease the number of choices?

While we cannot expect to find context-free answers, these questions provide a very suitable approach to discussing the viability of design decisions in actual project situations. Design, then, becomes a matter of *dealing carefully with choices*.

But, of course, Heinz's position on ethics is not confined to design. Allow me to portray Heinz once more. I have been in an interdisciplinary discussion on ethics with him, in Einsiedeln, in February 1994, where his approach was considered controversial. "Surely, this cannot be enough". "But we must have norms". "How about the choices of the murderer? Should they also be increased?" "What about the interests of social actors?" "And collective responsibility?" And so on. The discussion was heated and, as tends to be the case, when values are at stake, somewhat shrill.

I found myself not having any answers to these comments and observed Heinz as being silent. Then I was reminded of how he points out the self-referential nature of ethics. Our task is not to give theoretical analyses of abstract cases, but rather to include ourselves as participants in situated discussions. If I call for norms, what do I say about myself? About my willingness to take responsibility, and allowing others to take theirs? Which authority do I draw on? Am I not after control over what is good and bad? Through his very silence Heinz supported the process, in which such questions could be asked and dealt with, where everyone would feel included. Yes, undoubtedly, society develops and uses norms. But our willingness to accept and adopt established norms, ultimately rests on our choice. Thus choice comes first.

In talking about ethics, Heinz refers to human reality as a whole, and he likes to quote philosophers to make his stands clear. Two of his favourite quotations are included in von Foerster, Floyd (92). One is from José Ortega y Gasset: "Man does not have a nature but a history ... Man is no thing, but a drama. ... His life is something that has to be chosen, made up as he goes along, and a man consists in that choice and invention. ...". And the other from Martin Buber, who closes his treatment of the problem of man by stating: "We may come closer to answering the question: what is human?, when we come to understand him as the being in whose dialogic, in whose mutually present togetherness, the encounter of the one with the other is realized at all times." Heinz embodies the consequences of this in his life. Not only in times of joy and easy-going, but he shows a discipline and truly extra-ordinary devotion in the dark times, when staggering demands are made upon him in order to uphold his dialogical reality.

In closing

When Heinz participated in our conference in 1988, he called himself somewhat coquettishly a living fossil. Since then, he has become a superstar, and that at the age of eighty years. I have often wondered how the sudden surge of interest in theories of self-organization can be explained. To some extent, I believe, that this is owed to the collapse of ideologies in connection with the drastic political changes. Many people find themselves in need of a new orientation: not in the form of an explicit teaching, which would no longer be credible, but as a guidance in finding their own way. When chaos seems imminent, the emphasis on autonomy, on choice, and on dialogical responsibility provides just that.

In this paper, I have mainly explored the issues important to my area of work, bringing out the connection with Heinz's ideas. But at the same time, I have touched on more fundamental issues such as the nature of human understanding and our dialogical involvement with others. Taking self-referentiality seriously, this paper is also about my choices. My ability to make choices about my choices has certainly grown through my encounter with Heinz.

As I have shown here, I have come to know Heinz as a master of insight-building, at home in an epistemological workshop equipped with powerful tools, enjoying greatly to show an apprentice how to make good use of them. As a magician of the mind and of the heart, enchanting everyone by his brilliant talks as well as by his loving involvement. And as an outstanding practitioner of the Thou and I, in his private as well as his professional life. Thus, not only through his writings but also through his living example, he shows how making choices about choices transforms our thinking as well as our lives.

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