On 8 March 2007 Ernst von Glasersfeld attained the age of 90. In celebration of this, we take great delight in publishing this "festbuch" (from festschrift – defined as "a collection of writings published in honour of a scholar") as our way of saying thank you, and of sending greetings and our affection to this remarkable, honest and modest man.

Our festbuch is a tuned, amended and enhanced republication of the festschrift we published on the day of von Glasersfeld's 90th birthday in the journal Constructivist Foundations at *http://www.univie.ac.at/constructivism/journal/*.

A festschrift is a very particular publication, and as editors we have a particular approach. We do not like the ragbag of offerings that often appear as a festschrift, preferring instead that, in all pieces we publish, the work of Ernst von Glasersfeld takes centre stage. We also invited two types of contribution: the more normal academic paper, and smaller, anecdotal pieces which carry a more personal message. We are grateful to our authors for helping us attain the aim of centering on von Glasersfeld in realising this festbuch. We add our thanks, too, to photographers, artists and poets who have enriched the von Glasersfeld related material we have been able to publish, which, we believe, enhances the general quality.

One special improvement over the festschrift that the reader will find in this festbuch is the inclusion of papers written and selected by von Glasersfeld himself. These papers are (slightly revised) republications of published works. We have used these papers to articulate the division of the festbuch into sections, placing one at the beginning of each section.

Ernst von Glasersfeld has brought a remarkable rigour, energy and single-mindedness to his pursuit of what he has called Radical Constructivism. This is a form of constructivism that doesn't compromise by hedging, but goes straight to the crucial matter of the necessity for us to acknowledge our presence in our experience, for the observer to actually observe, for the mind to take part in the creation of the reality it describes as "sensed". In Glasersfeld's account, we always recognise that we are present.

It is not out intention to gloss Radical Constructivism here, in the introduction to a festbuch to celebrate and honour the scholar who has done most to clarify and elaborate it, so we will go no further down this path. Given that the more than 20 contributions to this festbuch cover virtually all aspects of Ernst von Glasersfeld's work, career, and personality, any detailed biography would also be superfluous. Rather, we provide, here, a "navigation aid" through these articles.

Overview

To provide the reader with a taste of Ernst von Glasersfeld's lucid, philosophical writing, we start the book with his 1980 paper on "Adaptation and viability". He deals with one of his central concepts, viability, against the backdrop of evolution in general and, in particular, sociobiology, which became popular in the late 1970s. The paper elegantly spans from animals to humans, and from evolution to cognition. In his essay, Ranulph Glanville writes a personal account of significance for him of meeting von Glasersfeld, and of how the questions asked of him by von Glasersfeld when they met have continued to fire his work to this day. Siegfried J. Schmidt, who played a leading role in making constructivist approaches popular in the German-speaking countries in the 1980s, summarizes von Glasersfeld's work and person, with a text based on his speech marking the award of the Gregory Bateson Prize presented to von Glasersfeld in Heidelberg on 6 May 2005.

Early Work

Von Glasersfeld not only focuses on scientific and philosophical topics, but (like his colleagues Heinz von Foerster and Gordon Pask) has a broad intellectual perspective also encompasing arts and literature. In his reflections on John Fowles's novel *"The Magus"* he skillfully combines literature with philosophy citing, amongst others, Paul Valéry, T.S. Eliot and Alain Fournier. The paper is a treatise on knowledge and being, which identifies Fowles as a forerunner of Radical Constructivism.

When von Glasersfeld started to publish scientific articles in the early 1960s he probably did not anticipate that almost half a century later he would have raised the number of entries in his bibliography to almost 300 (cf. *http://www.vonglasersfeld.com/*). Some of his early works seem to have completely disappeared or are no longer available. However, Paul Braffort rediscovered Ernst's first official scientific writing: a report on *Operational Semantics: Analysis of Meaning in Terms of Operations*, which appeared in 1961 as internal report of the Brussels-based European Atomic Energy Community (Euroatom). We are delighteghted to (re-)present this piece of Glasersfeld-excavation!

This, and the three publications that follow it in the festbuch were the result of Ernst's collaboration in the *Scuola Operativa Italiana*, headed by his mentor Sylvio Ceccato. Felice Accame's paper examines the relationship between the two scientists, whose primary connection was their lively in-terest in representation and linguistics. The paper by Renzo Beltrame further explores the theoretical status of the research at the *Scuola Operativa Italiana* and provides

a lucid account of Ceccato's position at a time when von Glasersfeld started to move on to new challenges in the USA. Scholars in the English-speaking world have known through von Glasersfeld himself of the connection with the Scuola Operativa Italiana and the respect in which Ernst holds Ceccato. But the lack of translated material has made both this point of origin in von Glasersfeld's work and the significant contribution of the Italians to early cybernetics, inaccessible. We are grateful to our Italian colleagues for their willingness to make available to us initial access to this material.

One of the American challenges lead to Ernst's work on the Language Analogue (LANA) project in the early 1970s, which gave him the opportunity to explore language use in non-human animal – the chimpanzee known as Lana. The essay by the formal project leader, Duane Rumbaugh, highlights the important role von Glasersfeld played. A central issue was whether chimpanzees are capable of learning the grammar of a language, and so von Glasersfeld developed an artificial pictogram-based language, Yerkish, to serve as communication vehicle between human and chimpanzee. Marco Bettoni's paper details this language. This is another area of Ernst's work that, although often mentioned, few of us have been able to follow in detail. We are delighted that we have the opportunity to bring this Italian and early American work back to the attention of interested scholars.

The Philosophy of Radical Constructivism

The second challenge von Glasersfeld commenced working on in the 1970s was the long-term project of a new "epistemology" (a philosophical term he would later become hesitant to use) based on his work in Ceccato's group; the operational and correlational approach on which the Lana project was built; and his interpretation of Jean Piaget's *épistémologie génétique*. He called this "Radical Constructivism". In addition to Ceccato and Piaget his philosophy has roots in cybernetic thinking. "Cybernetics," he wrote for the American Society for Cybernetics in 1983, "is a way of thinking, not a collection of facts." This relationship can also be found in the paper *"Feedback, induction, and epistemology"* which opens this chapter. The paper links the central notion of cybernetics–control–with Piaget's ideas about cognitive development and eventually introduces the reader to a Radical Constructivist notion of communication. The claim that the building blocks of language "cannot be anything but subjective" has made Radical Constructivism a successful paradigm for education: the teacher does not communicate knowledge to the student but the student has to actively construct it based on his or her own experience because it is the only material he or she has access to.

In his anecdote Jack Lochhead (who brought Ernst from Georgia to Massachusetts) describes his personal memories of the time when von Glasersfeld experimented with the chimp Lana while reading Piaget and cybernetics. Together with Lochhead, Leslie Steffe was one of those friends whose efforts were decisive in enabling von Glasersfeld to continue on this path. In his paper, Steffe first describes Ernst's collaboration on the Interdisciplinary Research on Number (IRON) project which focused on the question of how children construct numbers and solve numerical problems, fuelling the further development of Radical Constructivism. Steffe develops this, in the second part of his paper, with an idea of how Radical Constructivism can act as the core of scientific research programs and contribute to other Radical Constructivist research programs whose central problem is to explore the operations involved in constructive activity. One of the tenets von Glasersfeld has never tired of repeating is that "his" theory borrows insights from many scientists and philosophers. In his own contribution, Dewey Dykstra explores yet another link, the parallels between Radical Constructivism and Buddhist philosophy, which are clearly visible when it comes to "disequilibration" over mismatches between realist expectations and experiences – a difficulty Dykstra identifies as the perpetual problem of (mis-)understanding Radical Constructivism. While constructivist approaches share many distinctive features on the large scale, flavours differ in detail. Vincent Kenny's critical paper focuses on everyday implications as, in daily life, constructivists often appear naïve realists. This opens a gap between what we preach and what we practise. In another critical contribution, Bernard Scott argues that Ernst's assumption about the existence of a "subject" and "others" is one that needs further exploration and elucidatation. His paper extends Glasersfeld's ideas and proposes a co-emergent explanation of human awareness and self-consciousness, and with it the "experiential self." Scott's constructivist account of the "self as subject" avoids the need for any metaphysical assumptions by integrating ideas from George Herbert Mead, Humberto Maturana, Gordon Pask and Ranulph Glanville. Herbert Müller also paints a large picture**.** He discusses the place of Radical Constructivism and some of its implications in the development of an epistemology, with the aim of differentiating it from "traditional metaphysics." While Müller acknowledges the relevance of Ernst's work for a number of disciplines that suffer from conceptual problems such as the mind-brain relation, he urges us to evaluate its implications in specific instances. In his interview Vincent Kenny asks von Glasersfeld questions such as "How much patience does it take to be a constructivist?" and, by referring to the non-conscious aspect of automatisms in sports, he

points at issues which still need to be addressed more explicitly in Radical Constructivism. Karl H. Müller's critical article emphasizes the differences among various flavors of Radical Constructivism, especially what he calls Glasersfeld-style and Foerster-mode, with rather different theoretical premises and methodological tools. However, he is optimistic about the possibility of combining both versions, so that the combination may be used as a transdisciplinary agenda for empirical research. From a historical perspective his paper also contributes to a re-assessment of the 1960s and 70s which lead to today's constructivisms. And, finally, Alexander Riegler's contribution rounds off the section on the philosophy of Radical Constructivism. He discusses the allegation that Radical Constructivism is a dangerous intellectual tendency – an accusation that arises from misinterpreting it as solipsist philosophy or self-refuting naturalism which adheres to postmodernist unrestricted arbitrariness. By linking Radical Constructivism with formal network models Riegler not only avoids these criticisms but also presents it as a progressive philosophy which offers many starting points for future research.

Radical Constructivism and Teaching

However that may be, Radical Constructivism has already addressed and stimulated many aspects of fields other than purely philosophical discourse, among which education is prominent. An example of his natural didactic abilities is von Glasersfeld's *"How did Pythagoras do it?"* in which he presents an alternative and for students "a good deal more interesting" proof for the Pythagorean theorem.

Reinhard Voß's interview with von Glasersfeld highlights why Radical Constructivism lends itself to questions of teaching and education, opposing, as it does, the widespread idea that teachers can transmit knowledge through language. Marie Larochelle and Jacques Désautels's article indicates how taking a Radical Constructivist perspective can liberate educators to create new and valuable types of learning experiences. Radical Constructivism stresses the importance of developing a reflexive understanding of the world and prompts teachers to scrutinize the processes and the distinctions by which students chart their "worlds" and to devise models of their students' future relationships to the universes of knowledge it is intended they should learn. Ana Paztor's paper clarifies the operational usefulness of a constructivist framework or mindset for the teacher of mathematics (an area in which Ernst, himself, worked), and illustrates (with concrete examples from the author's own experience) the contributions Ernst made in this field. She devises a "shared experiential language" for teachers to *embody* in order to transform

their practice congruently according to constructivist principles. Utilizing this language allows the shifting of responsibility for success in mathematics from the students back to those who guide them in co-constructing knowledge. Based on the discussion of the epistemic positions of realism and relativism, Andreas Quale's paper focuses on the characterization of the teaching of science in a framework built from Radical Constructivism. The author distinguishes between cognitive and non-cognitive knowledge that plays through the characterization of the teaching of science, as contrasted to the teaching of religion. Since, he argues, teaching should be carried out in the mode of story-telling, Quale concludes that traditional ontology is not required for science-teaching. Theo Hug concludes the section on education with an anecdotal piece which seemingly weightlessly discusses some of Ernst's ideas against the backdrop of a skiing tour in the Austrian alps.

Radical Constructivism and its Implications for Society

The final section of the festbuch deals with the implications of Radical Constructivism for society. However, in order to understand the future one has to deal with the origins. In his introducing essay on *"The development of language as purposive behavior",* von Glasersfeld explores the origins of language, which is the main pillar of human society. Again he does not hide his scientific and philosophical background as he refers to cybernetics and Piaget, among others. For von Glasersfeld the linguist, language is a "splendid tool", and it seems obvious to him that also in the future language will have enhanced the survival of life on this planet.

The section continues with Gebhard Rusch's contribution which builds on the claim that constructivist approaches bridge the gap between cognitive and social facets of understanding. Rusch proposes we take understanding as consisting of both at the same time: a special kind of social regulation together with a special kind of cognitive regulation. The paper also contains a review of the German tradition of hermeneutics which it attempts to integrate within sociological considerations. Larry Richards's paper provides an account of the author's understanding of Ernst's theory and contributes a part concrete, part speculative connection between constructivist ways of knowing and constraint-based approaches to policy formulation, social transformation and design. For Richards it is evident that by raising new questions and stimulating new thinking Radical Constructivism contributes significantly to the development of a conceptual base for applied research on social action. Finally, Markus Peschl attempts to explain how wisdom is acquired. He proposes (and addresses) a need to extend the conception of

knowledge construction, as featured in Radical Constructivism, to include also a non-cognitive perception of the world on an existential level. He describes and discusses a particular learning strategy for this, "triple-loop learning", and a model, "U-theory," to implement this strategy. Both provide a valuable extension of the Radical Constructivist perspective that focuses on scientific and rational knowledge.
The festbuch concludes with three von Glasersfeld–related limericks presented by Stuart Umpleby, and illustrated with cartoons specially drawn by Mihaly Lenart (who also drew the cartoon in this introduction).

We believe Larry Richard states it well: "The work and thought of Ernst von Glasersfeld opens a path toward a rich array of concepts and ideas with the potential to inform efforts in a wide variety of human endeavors." After 90 years of constructing knowledge and wisdom, we can discern no end, or even slowing down. Ernst von Glasersfeld's active mental and physical life has not diminished. He writes, extending the reach of Radical Constructivism, keeping it clean. When a few years ago, von Glasersfeld's house burnt down, and with it he lost his extensive library and many first editions, he set to and rebuilt the house, and is currently constructing the furniture. He skis, with style and competence that shames many of his younger companions. Last autumn—a year ago—he concluded an email in which he discussed some scientific aspects with one of us (Alexander Riegler), with the words "At last we have some reasonable weather and I'm busy chopping wood for the winter." So we cannot but agree with Jack Lochhead who ends his essay with thoughts of the century: "We continue our preparations for 2017."

In 2005, the American Society for Cybernetics awarded Ernst von Glasersfeld its highest award, the Wiener Medal. The citation reads:
The Wiener Medal of the American Society for Cybernetics is awarded to Ernst von Glasersfeld for an outstanding and profound lifelong contribution to both cybernetics and the ASC.

Von Glasersfeld's seminal work, developing a contructivist approach
to problems raised by early cyberneticians, has enriched the field
and moved the conceptual base of cybernetics into
a more consistent vision — expanding the nature of
how we understand cybernetics,
how we enter into cybernetic processes of constructing our worlds,
and how we approach the consequences of this understanding.

We hope the reader will feel a resonance with this citation through the material in this festbuch.

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Finally, we assume the reader will join the authors, editors and all the others who have participated in its creation and publication in wishing Ernst the happiest of birthdays, and many more to come.

CONSTRUCTIVIST PERSPECTIVES