

# Constructing a Beginning in 1985

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**> Context** • Meeting Ernst von Glasersfeld for the first time in 1985, when about 70% of his work had still to be conceived, written and published, was a great stroke of fortune for me; it was based on my collaboration with Silvio Ceccato that had started in 1981 and it profoundly influenced my contributions to radical constructivism in the following 25 years of our friendship. **> Problem** • Presenting the details of how it all began can shed a light on the development of constructivist ideas. **> Method** • Anecdotes from 1979 to 1985 about how I came to meet Silvio Ceccato in Milan in 1981 and the influence of these events on preparing the 1985 meeting with Ernst von Glasersfeld, also in Milan. **> Results** • The article describes the timeline of 50 years of publications by von Glasersfeld, an anecdote about a connection between Ceccato and the University of Zurich in the 60s, the attempt to present Ceccato’s ideas as compatible and complementary with the neuroscience discourse in 1985, von Glasersfeld’s opinion about this attempt, and this attempt’s potential influence on the emergence of a new concept in neuroscience, “EEG microstates.” **> Implications** • The events and facts reported in the article help us to understand some aspects of an early phase in the development of radical constructivism, especially the relationship between Ceccato, von Glasersfeld and other members of the Italian Operational School such as Bruna Zonta, Felice Accame, and the author himself. **> Key words** • History of science, operational methodology, Silvio Ceccato, neuroscience, single activity state, EEG microstate, viability.

*“The intellect, therefore, does not find numbers but makes them.”  
(Juan Caramuel 1670, translated by Ernst von Glasersfeld 1984)*

## Introduction

In nearly 50 years of research, between 1960 and 2010, Ernst von Glasersfeld produced about 290 publications: some books, and many articles, conference papers or keynotes, and project reports.<sup>1</sup>

By looking at the timeline of their year of publication one can see that only 32 (11%) of these works were written during the 15 years (30% of the 50 years) before the term “radical constructivism” appeared for the first time in the history of constructivism in the famous “Report #14” (Smock & Glasersfeld 1974). In the following decade, from 1975 to 1984, 56 (19%) more publications appeared, many of them still related to his research in computational linguistics within the LANA project and the others more and more devoted to developing and clarifying his view of RC. A milestone in this period is surely the introduction to radical constructivism (Glasersfeld 1981) that first appeared in 1981 as the first contribution to

the original German edition of the successful collection of constructivist articles called *The Invented Reality*, edited by Paul Watzlawick (1981). In the next decade, between 1985 and 1995, there were 92 publications (32%), including his well-known book *Radical Constructivism: A Way of Knowing and Learning* (Glasersfeld 1995). Finally, in the last 15 years of his life, the number of works published was 110 (38%).

When I met Ernst von Glasersfeld for the first time in 1985 in Milan, radical constructivism was only 10 years old, he was already 68 and about 70% of his work had still to be conceived, written, and published in the course of the following 25 years of our acquaintance. Our friendship profoundly influenced my life, both intellectually and emotionally. As far as the intellectual side

is involved, I think that meeting Ernst in an early phase of the development of his ideas was a great stroke of fortune for me: this is why I would like to share with you the story of how it all began.

## A sentence that determined my life

In January 1983, about 5 years after leaving ETH Zurich, where I had earned my master’s degree in mechanical engineering with specialization in engineering cybernetics, I came back to the Department of Mechanical Engineering with a contract as a research assistant at the Institute of Machine Design. I was interested in doing my Ph.D in machine design theory and meth-

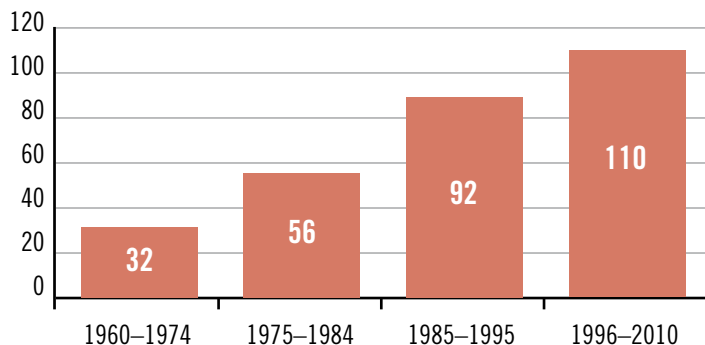


Figure 1: Timeline of 290 publications by Ernst von Glasersfeld 1960–2010.

<sup>1</sup> | Source: The official Ernst von Glasersfeld Portal at <http://www.vonglasersfeld.com>.

odology with Vladimir Hubka, a pioneer in engineering design science, who worked at that Institute. But more than design methodology, my true passion since 1979 was Silvio Ceccato's operational methodology, a cybernetic approach for the analysis of thought and meaning in terms of mental (attentional) operations. Thus, this move back to ETH Zurich was primarily motivated by the hope that being in an academic environment would facilitate my collaboration with Silvio Ceccato, which had begun in 1981.

I had heard about Silvio Ceccato for the first time in 1979, by a fortunate accident, during a conversation in Zurich with Luciano Persico, the director of SPE (*Scuola Professionale Emigrati*), a school for Italian immigrants. We were talking about how to improve learning performance in mathematics and I mentioned that I was finding helpful ideas in the work of David Hume (particularly *An Enquiry Concerning Human Understanding*); with a somewhat enigmatic smile, Luciano said: "You had better study Jean Piaget ...". Then he mentioned that he knew Piaget's theory from his study of psychology at the University of Zurich, and I asked: "Did you do your master's thesis on Piaget?" – "No, my professor sent me to Italy for that, it was amazing! Professor Moser<sup>2</sup> knew someone at the 'Centro di Cibernetica' of the University of Milan, a certain Silvio Ceccato, who had developed a new approach to the analysis of thought and meaning in terms of operations. He says that mental operations make up the meaning of words. Take for example 'part' and 'whole': when you talk of the human eye as a part of the body, this happens thanks to the mental operations of 'part'; but you can talk of the same eye as a whole organ, too – composed of the cornea, iris, etc. – when you apply the mental operations of 'whole'. The eye is not in itself a part or a whole or something else, it depends on your operations ..."

This sentence determined my future. I felt that this approach might lead to answering questions left open for me by the conventional explanations of basic concepts of mathematics and grammar given

2 | Ulrich Moser was first (1962–1968) associate professor for Empirical Psychology and later (until 1990) full professor for Applied Psychology at the University of Zurich (Maercker 2007: 7).

in schoolbooks and that had bothered me since primary school. On that same day I began to look for books by Silvio Ceccato; I found some of them in the library of ETH Zurich (Ceccato 1964–1966) and I was lucky enough to find the complete set of issues of Ceccato's famous journal, *Methodos*, in the library of the University of Zurich. This journal was also the place where I first read the name Ernst von Glasersfeld; but it took two more years before I met Silvio in Milan in 1981 and six more years before meeting Ernst, also in Milan, in 1985.

### A phone call from Athens to Zurich

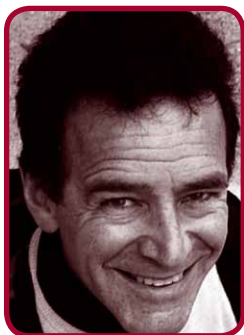
In the afternoon of 23 May 1985 (a Thursday) the phone rang in my apartment at Universitätstrasse 17 in Zurich. The telephone was in my office, and as I was busy in the living room at the other end of the apartment, I asked Miriam, my wife's sister, who had just arrived on a visit, to pick up the receiver.

I heard her speak into the handset of our fixed-line telephone, which was placed on a shelf near the door, and a moment later she put down the receiver and came to me: "It is a call from USA ..." she began, but was interrupted by my astonished reaction "From the USA?! Who would call me from there?" I really had no idea. "His name is von Glasersfeld or something similar, he spoke English and asked if he could talk to Marco Bettoni ...," Miriam said. I was surprised, happy, curious, and a little worried at the same time. Some days earlier (on 17 May 1985, a Friday) I had sent about 30 copies of my first research report (Bettoni 1985, see box) to selected scientists in Switzerland, Italy, the USA and other countries around the world; Ernst von Glasersfeld was one of the recipients, but I had not expected that he would contact me so suddenly. In fact up to that moment I had received no reaction at all from anyone, with one exception (C. A. Zehnder of ETH Zurich).

These and related thoughts were storming around my mind while I was walking along the short corridor that connected the living room with the office. However, as I seized the telephone receiver I suddenly had a strange empty feeling, a mental blackout.

With some hesitation and a broken voice I said, "Hello, here is Marco Bettoni ... are you Ernst von Glasersfeld?"

There was some noise on the line and the voice was delayed between speaking on one side of the Atlantic Ocean and hearing on the other. "Yes. I am ..." his voice sounded nice and friendly but rather low in volume and disturbed by the background noise on the line, I had to fully concentrate my attention on listening in order to understand what he was saying: "I am calling you from my office in Athens. I wanted to thank you for sending me your Report #1, it arrived here this morning and at first sight, I am glad to say, it looks like a very well done job!" I was very relieved, pleased, and honoured at the same time but that made my blackout even worse, I was almost speechless ... "Above all ..." von Glasersfeld continued "I am very delighted to see Ceccato's ideas taken over by someone else! Beside the scientists in your list I can imagine other people who will certainly be interested in reading your Report. I can give you their addresses, if you wish. One of them surely is Ms. Jehane Burns Kuhn in Boston (the wife of Thomas Kuhn, married in 1982) who in the 60s worked in Milan, first with Ceccato and later with me; another person that I could suggest is Prof. Siegfried Schmidt at the University of Siegen, a proponent of constructivism in Germany, who has very good relationships with publishers. But I don't want to hold you up too long on this subject; I will read your report more carefully today and send you some remarks and questions by letter together with the addresses. There is another reason for my phone call ..." In a way I felt relieved at the prospect that our conversation would quickly be finished, but on the other hand I was utterly disappointed to lose such a great opportunity! There was no time for regrets, however, as von Glasersfeld continued: "... and it is related to a trip to Europe that I am going to make in a few weeks. It could give us an opportunity to meet! And since air mail from and to Europe sometimes takes more than three weeks to arrive, I thought that it would be better to talk on the phone. The Instituto Piaget in Lisbon has invited me for a workshop, I will be in Portugal for this event from June 24 until July 7 and after that I could come to Milan for a few days; we could meet face to face and talk, if you like,



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is Director of Research & Consulting at the Swiss Distance University of Applied Sciences. After receiving his masters degree in mechanical engineering in 1977 from the ETH Zurich he worked for industrial, banking and academic organizations in the domains of machine design, engineering education, IT management, IT development and knowledge engineering (Artificial Intelligence). In 1991 he became professor of knowledge technologies at the Basel University of Applied Sciences (FHBB). In June 2003 ETH Zurich appointed him as “guest researcher” to investigate the role of knowledge-oriented cooperation in knowledge management. Since 1981 he has been collaborating with Ceccato’s “Scuola Operativa Italiana.”

perhaps even meet Ceccato ... do you think that you could arrange a meeting with him? I haven’t seen Ceccato since my departure from Italy 20 years ago ...” The idea of a “historical” meeting between Ceccato and von Glasersfeld suddenly reanimated me, I saw the opportunity to reconnect the two friends and thus contribute exactly to the goal that I was pursuing with my work on Ceccato’s ideas: “to reintroduce Ceccato’s ideas into modern neuroscience for discussion, critique and utilization in future research” (Bettoni 1985: 13). This recovered my mind from the temporary blackout and speechlessness: “Of course I would like to meet and talk with you face to face, and also with Ceccato - great idea! He usually goes to his house on the island of Vulcano in July, but since it is only the end of May I am confident that we will be able to find a suitable date for meeting in Milan. I will talk with him and with Bruna Zonta and let you know soon.”

### Letter of 17 May 1985

In my archive I found copies of all the letters that I sent with my Report, including that to Ernst von Glasersfeld, written in Italian and sent on 17 May 1985. At that time I had no idea of his “improbable life” (Glasersfeld 2010) but from the translations printed in *Methodos* and from the short biography at the end of *The Invented Reality* (Watzlawick 1981), I was sure that Ernst would understand Italian and maybe appreciate a well-written Italian letter even more than one in my “Italian English”. The address to which I sent it was “Department of Psychology, University of Georgia, ATHENS, GA 30602, USA”.

Ceccato was mentioned about 6 times, first in the subject line (“Model of the mental functions of the brain according to Silvio Ceccato”), then in the opening (“... for more than four years I have been in close contact with Prof. Ceccato, with whom you collaborated, and I therefore also know some of your publications in *Methodos* and other scientific magazines.”) and in the following part. I emphasised that I had read his chapter “Introduction to Radical Constructivism” in the book edited by Paul Watzlawick and deduced (among other reasons from his already mentioning Ceccato in the beginning) that he would perhaps appreciate my Report. After that the main part of the letter explained briefly my motivation and objective: to reintroduce the ideas of Ceccato into Neuroscience by means of a more “technical” text and to look for financial support for my research projects on Ceccato’s approach.

### IMS 17 Report Nr.1 – 1985

How did it come about that I decided to write the above-mentioned Report #1, more than 100 pages, that von Glasersfeld had appreciated as “a very well done job” and that had motivated him to call me from the USA? Only three months earlier, on 13 February 1985, I had had a meeting with Günter Baumgartner (1924–1991), a neuroscience professor and, since 1967, chair of the Department of Neurology at the University Hospital of Zurich. He was playing a key role in the development of Zurich as an international brain research site; among other things, since 1971 he had opened an EEG lab and engaged Dietrich Lehman from San Francisco, who in Zurich did some seminal

basic research work, for example, on visual evoked potentials or brain electric microstates (Hess 2008: 194).

In my notes I have found, among other details, the first sentence that Baumgartner said when our meeting began: “What is your problem?” Well, I thought, this opening is not surprising coming from a physician, but I am here to talk about an opportunity to advance an interdisciplinary domain of research, I am not sick! So I began to talk about my cooperation with the Italian cybernetician Silvio Ceccato, who had developed an outstanding, radically new model of mental processes, which in my view could be of great value to brain research.

Baumgartner was very sceptical: for instance, when I said that one of the main features of the model was suggesting an attentional organ and postulating a primary role for attention in cognition, his reaction was: “For decades hundreds of researchers worldwide have been searching for an organ of attention, without success!” Only five years later, Lehman – the above mentioned EEG specialist in Baumgartner’s department – published his first paper mentioning “microstates” and characterized them as “atoms of thought” (Lehman 1990). In my report I had used the term “single activity state S” and introduced them by saying: “The single activity state S can be seen as a kind of ‘building brick’ for the basic constructions of mind. In my model this building brick is produced ... by a sampling activity” (Bettoni 1985: 63). Ten years later, after retiring from the University, Lehman founded in Zurich the “KEY Institute for Brain-Mind Research” and privately continued research into EEG microstates. What a pity that Lehman did not participate in the meeting and that we never

met in the following years, even though until 1990 I lived in Zurich, only some hundred meters away from the research lab where he developed his “microstates” approach!

After a number of his problem-focused rather than solution-oriented comments, I finally asked Baumgartner explicitly: “How could you help me?” First of all he complained that his Department had only a small budget for new jobs, then he suggested I submit a grant application to the Swiss National Science Foundation and explained some requirements that any research proposal had to satisfy in order to be successful; moreover, in cases of transdisciplinary research such as this, professors from other departments also had to be involved, at least a specialist in automation (he mentioned Mohamed Mansour, Head of the Institute of Automatic Control and Industrial Electronics, ETH Zurich) and one in Computer Science. Finally he offered to review my proposal and wished me good luck.

Three months later I sent him my report; in the accompanying letter I tried to explain why I had produced a much longer text than the 15 to 20 pages that he had suggested. I did not mention that the text was not itself intended as a project proposal for a grant application because I thought that this would go without saying. I never got an answer. I was very disappointed but never tried to contact him again and ask for a second meeting because I felt that Baumgartner’s silence had some deeper reasons that no meeting and no report could have changed: among them the fundamental incompatibility of Ceccato’s approach with the dogma of knowledge as representation of a given reality that in those days – according to what I was seeing in the scientific literature – was still tacitly accepted by the majority of the neuroscience community as a firm, uncontested foundation.

## Preparing the meeting in Milan

In the following week after the phone call, Ernst von Glasersfeld’s announced letter arrived, dated 24 May 1985, and enclosed with it were reprints of a couple of his recent papers. In one of the first sentences of the first part of the letter, Ernst von Glasersfeld had summarised his work in radical con-

### BOX 1: IMS 17 Report Nr. 1, 1985

*A Psychological Basis for Human Information Processing. Mental Operations between Receptors and Effectors in the Approach of Silvio Ceccato. An Introductory Engineered Version by Marco C. Bettoni. IMS 17, Institute for Methods and Structures, Universitätstrasse 17, CH 8006, Zurich, Switzerland, (123 pages).*

**Abstract [page 5]:** Silvio Ceccato’s approach to Human Information Processing (HIP) is presented here in an updated, structured and condensed form. Aim of this presentation is to attract the attention of neuroscientists on ideas which could help neuroscience in the mind-system identification task, both at psychological and at physiological level. The report develops a structure, called 7-Units-Model (7UM), as a frame by which the “Operativity principle”, the “Building brick principle” and the “Principle of double-step assembling” can be explained. The 7UM allows to describe in a structured form what is meant in Ceccato’s approach by: mental operations, mental categories, mental constructs, mind, and how mind works when we perform higher functions as: attention, perceiving, representing, thinking, language, consciousness, etc. What is new is that the approach describes at a psychological level a basis (basic mental functions) for these higher functions. An important feature of these basic mental functions is that they can provide an experimental description of the way how the brain “creates” information. “Creates” means here that responses to a stimulus depend more on the operations established and applied by the subject than on the operations imposed to the subject by the inputs. This view fits at neurophysiological level with some recent discoveries by Freeman (1981, 1983).

#### 4. Discussion, conclusion and recommendations [pages 105–106]

The main objective of this Report was to introduce to Ceccato’s approach to Human Information Processing in a compact form allowing a rapid survey and an integration into neuroscience.

**4.1 The rapid survey.** The main problem here lies in the fact that Ceccato’s ideas require the introduction of many new notions as: the mental level underlying higher functions; the mental operations, the mental categories, the S-compounds, the single state S; the triads, the assemblies; etc. A solution to this problem has been developed in this Report [...]

I have shown that the 7-Units-Model can be used as a main frame for the introduction to Ceccato’s ideas: it was possible to put into this frame all the components of his approach. The resulting building contains in a structured form the material necessary to support and explain the 3 main principles of the approach: the operativity principle, the building brick principle and the principle of double-step assembling [...]

**4.2 The integration into modern neuroscience.** At different points of the presentation some links with neuroscience, particularly with neurophysiology, have been sketched. I have shown that especially the latest works by Freeman (1981, 1983) fit very well as a neurophysiological basis for Ceccato’s psychological approach. Reversely, I have also tried to show that Ceccato’s approach could help all those neuroscience researchers which are on the line of Freeman’s approach[...] The utility of Ceccato’s model lies mainly at the step labelled as “Determine the relevant physical processes” and at that labelled “Identify the essential basic processes”. As stated by Profos, this is a crucial step in any system identification task (Profos 1982: 66): “The most important and usually also most difficult among the four mentioned steps during deductive model construction is not, as one often supposes, the step ‘mathematical formulation’ but ... the step consisting in the identification of the essential basic processes” I suggest that great advantages will result in neuroscience research by integrating Ceccato’s ideas into step 3 (and 2).

structivism up to then: "... I have not been concerned with what I would call Ceccato's 'mental mechanics' but have rather tried to develop a theory of knowledge consistent with that mechanics." In his opinion, he explained further, "Ceccato's attempt to throw away the word 'knowing'" (Ceccato 1964: 4-14) had been an error of tragic consequences because it alienated from him even those whose thinking was closest to his own.

The second part of the letter contained some questions related to my Report and in the third part Ernst gave me the exact coordinates of the Piaget Institute in Lisbon (Lote 544 Zona J de Chelas, 1900 Lisboa) asking me to send a copy of my answer there, too. Finally, in the fourth part he wrote the addresses of the two people mentioned in the phone call as potentially interested in my Report: Jehane Burns Kuhn and Siegfried J. Schmidt.

On 5 June I reached Ceccato by phone and he confirmed that he would be staying in Milan between 8 and 13 July and would be happy to invite us for lunch at his home, the small apartment in Corso di Porta Vittoria 32. A few days earlier I had also spoken with Bruna Zonta, since 1959 Ceccato's permanent research assistant at the Centro di Cibernetica. She offered her apartment in Milan as accommodation for Ernst to stay in during his visit to Milan and also contacted Gianni Degli Antoni, director of the Cybernetic Institute at the University of Milan, who declared his interest in organising a lecture by Ernst von Glasersfeld within his workshop, "Information Science". I sent all the details to Ernst and he wrote to Degli Antoni suggesting 10 July as the date for the lecture.

## Meeting in Milan, July 1985

On the afternoon of 8 July I went to the airport of Milano Linate; the flight from Lisbon scheduled for 6:45 pm arrived on time. It was a warm, sunny day, and, as the sun was going down, shadows and diffuse light rays were creating a lovely atmosphere, even in the ugly arrival hall. I did not have a picture of von Glasersfeld but we "recognized" each other without effort. I saw a man with a nice, friendly expression and long white hair coming with his luggage towards the small

group of people that was waiting for the new arrivals; he looked around briefly and when he came towards me, I already had made some steps towards him: "Are you Marco Bettoni?" - "Yes, nice to meet you Prof. von Glasersfeld and welcome back to Milan!"

In the evening we went to a restaurant in the city centre with Bruna Zonta and Felice Accame. At the table the conversation touched on many subjects: memories of the collaboration on the first machine translation research project of 1959, or news about colleagues such as Pier Paolo Pisani, who had become director of the computer centre at Harvard University. We talked about traces of operational thought that we had found in literature, for instance in Marcel Proust and his almost operational description of gestures, or in *The Magic Mountain* by Thomas Mann, where the totalitarian Jesuit Leo Naphta says things that seem to come very close to some of Ceccato's statements. It was on that occasion that I first heard about Yerkish, the artificial language created by Ernst von Glasersfeld in 1971 in a project with the chimpanzee Lana for exploring her linguistic abilities (Bettoni 2007).

The next day, 9 July, Ernst and I were invited for lunch at Ceccato's home. I knew that Ceccato considered Ernst as his best collaborator but at the same time he also was very disappointed about Ernst's working on a theory of "knowing", which Silvio considered as a fallacy. Thus, although I was proud to have contributed to the organization of this "historical" meeting after 20 years in which they had practically had no contact at all, I was looking forward to the lunch meeting with contradictory feelings that increased my emotional stress. We talked briefly in the living room but moved quickly to the balcony, where the table was ready for lunch. Suddenly I felt such a strong headache that I was forced to leave the table and went to lie down in the bedroom. What a disappointment! I missed the whole lunch and the conversation of that historic encounter between Ceccato and von Glasersfeld, the culmination of my efforts! In the afternoon Ernst and I went to visit an art exhibition near Ceccato's home, at Palazzo Reale. While walking to the building I asked him how the reunion had gone. Ceccato had been very polite and friendly, von Glasersfeld said, but rather dismissive about the new con-

cept of "viability" and reluctant to engage in a discussion about it: in his view "viability" was a return to scepticism, a recidivism in "philosophia perennis", a backsliding to the "inconclusiveness of all philosophically orientated inquires" that Ceccato had criticized in his early work (Ceccato 1960: 21). I wasn't surprised: having collaborated with Ceccato since 1981 - mainly working on the translation from Italian to German of about 600 pages of his new book *Il Punto* (Ceccato 1980) - I had expected this kind of reaction. My hope had been that I could play the role of a mediator between the two friends, and build a bridge between the two scientists that I admired and appreciated most of all and whose insights were, in my view, absolutely compatible and complementary.

On 10 July at 4 pm Ernst gave, as planned, the lecture at the Cybernetic Institute; on the copy of the announcement that I have kept in my archive I found the following title (translated from Italian): "A self-regulatory model and constructive awareness". The abstract announces the following subject of the lecture: "Sketch of the constructivist approach, which replaces the correspondence relationship of the philosophical tradition with the relationship of "viability" between conceptual structures and ontology. In this model "information" does not concern an objective reality but rather the choice of constructs which up to now have been assessed as functioning."

## Conclusion

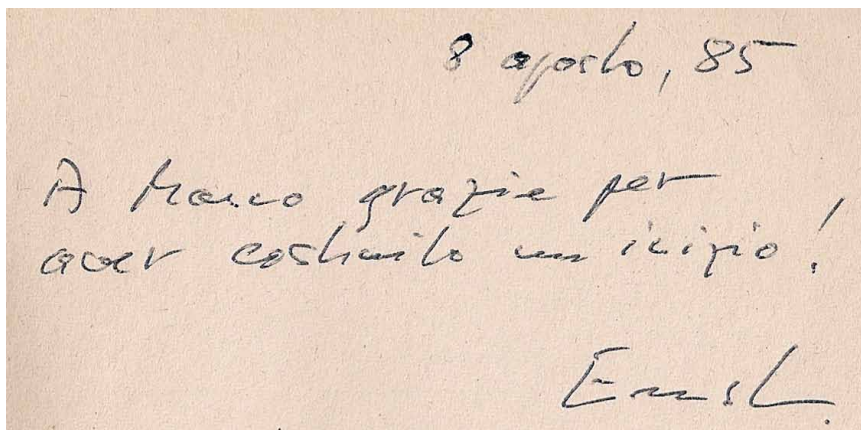
Before leaving Europe, Ernst spent a wonderful day in Tuscany with his daughter, Sandra, and some days in Germany and the Netherlands for workshops on "Didactics of Mathematics". I sent him a recent book by Ceccato and Zonta (1980) and the catalogue of the exhibition of works by George Grosz that we had visited together in Milan: "Gli anni di Berlino / Die Berliner Jahre" at Palazzo Reale in Milan, held from 30 May to 28 July 1985. In his next letter he enclosed a small book, "Of of", which contained one of his most recent papers (Glasersfeld 1984). On page 2 it had the dedication shown in Fig. 2.

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**Figure 2:** Dedication on the first page of a copy of Pedretti (1984).  
 “8 August 1985. To Marco thanks for having constructed a beginning! Ernst.”