

Designing In Ulm and Off Ulm

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Why did I come to Ulm?

I graduated from the Staatliche Ingenieurschule Hannover, now Fachhochschule Hannover in 1954, two and a half years before I became a student in Ulm. I concluded my engineering education with the design of a rotary steam engine for automobiles—a design without precedent, still awaiting further development for its appealing ecological and other technical properties, which occupied my thinking at that time. Upon graduation, I also passed a qualifying examination (Hochschulreife) that would allow me to study at a proper university without *Abitur*. I hoped that this examination would get me back on my educational train, which was derailed by the aftermath of World War II and escape from East Germany, like many of my generation of students.

For engineers, it was not difficult to find jobs. West Germany was reconstructing its industry, and engineering was considered instrumental. I was fortunate to find work at a consulting firm in Düsseldorf, which handled diverse projects: designing manufacturing tools and equipment; planning assembly lines; resolving production management problems; and proposing new factory buildings, which I enjoyed conceptualizing. I was well-qualified, excelled in these environments, encountered no problems in calculating almost anything clients required, and developed more than my share of innovative proposals.

Although design was in my bones, I was dissatisfied, however, for three reasons. On the one hand, I was the youngest engineer of the lot and felt that I was not given the opportunity to realize my ideas. On the other hand, I was appalled that in disputes between the top management and the organization of the factory of our clients, which we were asked to mediate, my employer always sided with those who paid us, dismissing the findings of our careful investigations and the solutions we proposed. Idealist as I was, I found that opportunism despicable. Finally, I increasingly found the purely technical problems we solved too easy and no longer challenging. I yearned to tackle the complexities that humans introduce into technology and life.

I knew Cornelia Koch from the *Wandervogel*, a loosely organized group of restless young people who explored Europe hitchhiking but also engaged political, social and environmental issues. Cornelia had just begun studying at a new Hochschule für Gestaltung in Ulm (HfG) and described it to me in glowing terms. The school was the first new post-war university-level institution in Germany. It was heralded as the successor of the Bauhaus but with a new educational mission and an exceptional architecture that gave expression to these ideas. The school offered a four year course of study terminating with a diploma in design. This compelled me to apply.

I remember the unusual questionnaire that came with the application form. It asked what we had done before, why we would want to study at the HfG, and how we defined our aspirations. Most extraordinary, however, it inquired about the newspapers we read, which public figures were important to us, the movies we liked, our opinion about several depicted examples of art, architecture, and design, and what we thought were the causes of fascist forms of governments. The school seemed to look for students who connected intellectual, cultural, political and technological conceptions and willing to act accordingly. To me this was most appealing. As samples of my work, I had only technical drawings to show, but selected some that had to do with human contacts—interfaces, as we would say now. Much later did I learn of the irony of my admission. It was my very engineering background, from which I wanted to escape, that had made me an attractive candidate for the school.

But there was another reason for being attracted to in the HfG Ulm. In the *Wandervogel*, which I joined shortly after escaping from East Germany, we were not just hitchhiking through Europe whenever we could, we were also volunteering to reforest Germany; debating Marxism with the FDJ, the East German State youth organization; demonstrating in Strasbourg for a United Europe; and trying to make sense of the Nazi-era of our parents. We were familiar with the story

of the White Rose,¹ a group of students who were executed by the Nazis in 1943 for producing and distributing anti-Nazi leaflets. We knew that Hans Scholl, a member of the White Rose, had been affiliated with the «*deutsche jungenschaft d.j. 1. 11.*,» an offspring of the *Wandervogel*, outlawed by the Nazis in 1934, but clandestinely continuing within the Hitler Youth. Their heroic and typically *d.j. 1. 11.*-actions were an inspiration to many of us. Naturally, the association of this resistance group of students—coincidentally about my own age when they were put to death—with the Geschwister Scholl Stiftung (the school's foundation and administration), named in memory of Hans and Sophie Scholl, was especially attractive to me. The Stiftung was founded in 1950 by Inge Scholl, a surviving sibling of the Scholls, received an initial grant of one million Marks from the U. S. High Commissioner for Germany, John McCloy, plus some funds from German sources, to realize what ended up Max Bill's proposal for a new kind of design school. Placing design into the context of the political contingencies of post-war Germany rather than exclusively in art found additional resonance with me.

First and Guiding Impressions

In the summer of 1956, before the fall in which I became a student at the HfG, I visited the school on Ulm's Upper Kuhberg. The very first and overwhelming impression that I clearly remember was its brightness. The buildings were spacious inside with large windows; dividing walls between light gray concrete columns were white or untreated natural wood. There was nothing fancy, pretentious, or monumental. Perhaps it was the summer sun that made a difference, but the incredible brightness gave me the impression that the future was built into its buildings.

The arrangements of the buildings—student housing connected to generous common areas, followed by the library facing the office of the school, the class rooms and finally the workshops—were on different levels, exteriorly hugging the landscape and interiorly built on a human scale. Starting with my first visit, I recall animated discussions at the conversation-friendly coffee bar, run by students.

Its inside was not quite finished, conveying a sense of opportunity and growth. Students from the previous school year had put their work on display, providing me with a good preview of what would await me three months later. Students seemed to have come from all over the world to study there. I was enthusiastic and could hardly wait to start.—

Let me organize my experiences chronologically.

Basic Course (*Grundlehre*) – First Year

The basic course coped with that diverse student body, challenging the various preconceptions that we came with

and socializing us into the school's culture. It created a common ground for design, a language, and a vision before we would specialize in one of the four areas taught at the school.

All first year students, regardless of their interests, found themselves in one room. The equipment was basic: a drafting board (*Zeichenplatte*), two stands, a stool (the now famous *Ulmer Hocker*) and a small chest of drawers—all manufactured at the school's workshop by its able master, Conrad Hildinger.

Naturally, students came with rather unequal backgrounds. Some had completed apprenticeships in carpentry; others had studied graphics, worked as draftsmen in architectural offices, or had made jewelry. Some were young artists eager to find themselves; others came with an *Abitur* but little practical experience. Some had begun their graduate education in arts and crafts schools and were attracted to the HfG for a variety of reasons. Almost half of the students came from outside Germany, the majority from Switzerland.

Faculty took turns for two- to three-week periods each and gave identical assignments to every student, intended to introduce rigor and imagination—a creative paradox I much later learned to appreciate. Problems were posed in the morning, leaving the afternoons to attend lectures on more general topics, leaving barely enough time to work on the problems, often consuming the evenings and nights. One of the teachers I recall vividly was Helene Nonné-Schmidt, who had been at the Bauhaus and now taught color theory using water colors—systematically over-painting overlapping areas with basic colors, creating systems of different hues. Her exercises made irrelevant the idea of artistic self-expression. Those unwilling to suspend preconceived ideas, be patient, and apply extreme care would not be able to create the effects of combining primary colors to create secondary, tertiary ... colors, and could see for themselves whether they succeeded or failed the exercise.

Another outstanding teacher was Hermann von Baravalle,² a master and inventor of amazing geometric constructions on paper and in three dimensions, who increased our repertoire of forms by helping us appreciate principles underlying their construction. His fascination with the subject was contagious. He did not fall into the stereotypic preference of Ulm for rectangular shapes. Among the spatial demonstrations he once brought into the room was a twistable cylinder made by connecting the edges of two circular disks with numerous strings, through which one could project all kinds of curves. The intersections that emerged would create astonishing forms of increasing complexity. We were asked to draw patterns, largely with black ink on white paper, using a ruler, compass and string. Following certain easily stated principles repeatedly, we created ellipses, hyperbola, hyper geometric curves and other unnamable

1 Inge Scholl (1952). *Die Weiße Rose*. Frankfurt: Verlag der Frankfurter Hefte GmbH; — (1983). *The White Rose; Munich 1942–1943*. (Tr. Arthur R. Schultz). Middletown CT: Wesleyan University Press.

2 See Hermann von Baravalle (1957). *Geometrie als Sprache der Formen*. Freiberg im Breisgau: Novalis Verlag.

forms. After some obligatory exercises, we could follow our own principles and discover to where they would lead. As an engineer, I did not have too many problems with the required accuracy. However, students with fine art backgrounds had difficulty, not only in drawing straight lines with equal thickness, but also doing so consistently. Many of these patterns resulted in Moiré effects that amplified the slightest imprecision. Such exercises encouraged both self-discipline and an appreciation of complex geometric regularities, common to solving many design problems. By demonstrating how simple but repeatedly applied rules could generate amazingly complex forms, his course gave geometrical expression of one of the pillars of the school's culture: justifications of how one came to a particular design.

Herbert Ohl, pursuing industrialized building, asked us to design two- and three-dimensional structures using just two kinds of elements. Fritz Querengässer taught typography, layout and grids. Otl Aicher made us aware of typographic principles of constructing alphabetic characters and Eugen Gomringer was assigned to increase our sensitivity for language and taught the principles of his «concrete poetry».

Tomás Maldonado, a former painter and now the director of the basic course, was the only one who had more general pedagogical ideas for the course. He conceived a visual methodology consisting of three components, theory of perception, symmetry, and topology. For him, theory of perception embraced gestalt principles, symmetry the systematic transformations of shapes, and topology the relations of forms in space. I was fascinated by gestalt perception and read everything I could. Maldonado's treatment of symmetry heavily relied on mathematical shapes, such as Peano surfaces, Sierpinsky triangles, Klein-bottles and Moebius bands. The latter had inspired sculptures by Bill. Having been a painter, he had not that much to say about topology. Maldonado posed seemingly paradoxical problems; for example, «imprecision with precise means,» «black as color,» «a body whose outside and inside surfaces are contiguous.» Many of Maldonado's exercises would yield beautiful images, although beauty was not their purpose. Most of them required filling in hundreds of small areas between mathematical curves or in grids with tempera paint, mixed in various proportions.

This brings me to a story: In October 1956, Hungarians rose up against Soviet occupation. The Red Army crushed the revolt and caused many refugees to flee into neighboring Austria. Austrian institutions were overwhelmed and *Wandervogel* friends of mine, including my brother Ekkehart, took their pre-Christmas vacation to hitchhike to the Austrian-Hungarian border to help out. For several of us in the basic course, painting thousands of tiny squares to com-

plete Maldonado's assignment while a human tragedy was growing in Austria seemed morally absurd and totally out of sync with reality. By Christmas, quite a number of students from the basic course who followed these developments closely decided to volunteer, just for a week. Hearing about our intentions, Maldonado, understandably, did everything to prevent this from happening. He held our student representative, Edgar Decurtins, responsible if we were to leave. The number of students who were not intimidated by threats of dismissal shrunk down to five: Nick Chaparos, Bernd Meurer, Werner Kilian, Hermann Edel and I.³

Nick, the American among us, owned a Volkswagen Bug and provided the transportation. It was very cold, however, and the heater of the car was totally inadequate. We arrived at the Hungarian-Austrian border freezing and far less prepared for the cold than those fleeing Hungary. But we were soon rewarded by meeting the most remarkable volunteers: a Swiss Chef who had left his hotel kitchen to cook for refugees; an Austrian medical doctor who now practiced in a barrack; two Norwegians who operated a boat across a canal ferrying refugees from the Hungarian to the Austrian side; members of the German Samariter Bund who drove refugees from the border to reception camps; a group of teachers and students who gave up their Christmas vacation to work in a camp. We too worked in that camp for a while. However, feeling underutilized and failing to get through to the organizer of the relief effort in Vienna, a member of Vienna's nobility, for a more meaningful assignment, we gave up. Because youth hostels in Vienna were full and we were unwilling to pay for a hotel, we «succeeded» in spending an unforgettable night in a dark Vienna prison among prisoners with little sleep and on our return trip survived a dramatic car accident on the Autobahn. Nevertheless, back in Ulm, we felt good, having lived up to our moral commitment and painted the required squares but now with less drudgery.

Some of the assignments during the first year involved using the workshops at the HfG—plaster, plastic, wood, metal and photography—teaching us to handle different media. Experiments in photography, directed by Wolfgang Siol, were most exciting for me.

But of more enduring value were regular seminars by Erich Franzen on sociology; Max Bill on 20th century art history, which consisted mainly of Bauhaus artists and designs; Hans Sperlich on cultural history, using a wealth of slides; Elizabeth Walther on scientific methodology; and most importantly, by the philosopher, Max Bense, who undoubtedly was the intellectual backbone of the school at that time.

Bense wrote an amazing number of books, developing an information theory of aesthetics and gave spellbinding

3 We were not the only ones taking this trip. Independently of us, Monika Buch from our basic course, and Cornelia Koch, a year ahead of us, had the same idea and hitchhiked to the Austrian-Hungarian border as well.

lectures on this subject, but also on the philosophy of science, morphology and methodology. Bense was an abstract thinker with high standards; impatient, always looking for radically new ideas, but he was also able to listen. In one of his seminars, I developed an idea about the cultural dynamics of technological development, and although it was extremely simplistic by my current understanding, he took it seriously and dwelled on it. In addition to regular courses, a large number of guests visited the school for a day or two, gave a lecture, usually on Wednesdays, bringing cutting edge ideas to our attention.

The other engine at Ulm was Max Bill, the conceptualizer of the school, the architect of its buildings and its first Rector until 1956, just before I joined the school. He had invited virtually all professors then teaching there. He was a renaissance product designer, graphic artist, painter, sculptor, architect, important theorist in the concrete art movement and a one-time member of the Swiss parliament (Nationalrat). He had written a book, simply titled *form* (lower case in the original and also used in publications and correspondences of the school) in which he outlined his vision for a new integration of technology and culture through design. He saw in the school the possibility of contributing to the democratic reconstruction of Germany. A decade after the end of WWII, Germany was still pretty much in shambles.

In the fall of 1956, the Swiss Werkbund met at the school, and Bill gave the plenary talk, not about the school's architecture or its curriculum (about which he had every reason to be proud), but about the morphology of design. He drew several concentric circles and argued for a rational approach to design, satisfying four kinds of functions: technical, material, production and aesthetic, the latter permitting intuition to play a role.⁴

Just to give a flavor of how things were accomplished in Ulm, one day, during a break, Bill came into the room where we first year students worked. He told us that he had to complete an entry to an architectural competition, and invited anyone who could help bringing the project to fruition to join him. For a few days, one of the unfinished rooms at school became an architectural studio, and after a day of required student work, volunteers with architectural drawing skills worked in shifts through several nights to complete Bill's project. Those who could not draw, made coffee, organized the drawings, typed narratives, and those not directly involved learned from the process. While I personally had little to contribute, this kind of spontaneous collaboration was inspiring. Later in life, I remained attracted to such spontaneous collaborations and sought it out where possible, but missed it in much of my academic career.

Bill's influence was felt everywhere. All the more were we shocked when one day, toward the end of my first year, the Mayor of Ulm, also President of the Board of the Geschwister Scholl Stiftung, the school's foundation, called faculty, students and staff together for a meeting to announce that an agreement had been reached between the parties concerned to sever all ties between Bill and the school, starting with the new academic year 1957–58. Personally, I did not come to the school for Bill, but many students felt betrayed. I recall Bertus Mulder from The Netherlands standing up during this meeting and protesting on behalf of many students present. This administrative action, apparently imposed on Bill, caused a split within the student body and sowed deep distrust in the administration that lingered on for years. Admittedly, Bill was an autocrat who never hesitated to speak his mind about anything. Diplomacy or other people's feelings did not matter much to him. But on issues of design, he had an uncanny analytic eye and was always right. I guess it must have been difficult for junior faculty, such as Maldonado, Aicher, Hans Gugelot, and Walter Zeischegg to always play second fiddle to Bill. While Maldonado rationalized Bill's forced departure by arguing that the school had to overcome Bill's roots in the Bauhaus with a new conception of itself, I contend that his departure was the result of an unnecessary power struggle between the junior faculty scheming with the Geschwister Scholl Stiftung and Inge Aicher-Scholl against their erstwhile mentor.

A few days before my second school year started, there was a spontaneous goodbye party for Bill in what we called the «Rote Höhle.» At some point, and after a glass of beer or wine, a couple of strong students, among them Willi Ritz and Bertus Mulder, took Bill on their shoulders and proceeded to give him a mock guided tour through his school buildings. Bill took a piece of chalk out of his pocket and jokingly signed a wall with his name. The following morning, several of us, armed with a hammer and chisel, made that signature permanent before Hausmeister Streckfuß could see the chalk and remove the signature. It is still there.

In spite of this disappointment, for me the basic course was an exciting and transformative experience. It opened me to ideas I could not have contemplated on my own. We were encouraged to be creative, but not without systematic inquiry and appropriate justifications for what we did and how we came to it. Reducing design to a principled process of generating newness has become fundamental to my approach to design and realizing this paved the way to my future explorations.

Although during the first year, students did not work in teams—we were judged individually after putting up the results of our assignments on poster boards—by working in

⁴ For a longer discussion of his functionalism, see pages 289–303 in Klaus Krippendorff (2006). *The Semantic Turn; A New Foundation for Design*. Boca Raton, London, New York: Taylor & Francis CRC.

the same room, students became each others' most important critics and guides. As students, we were in the privileged position of making connections between assignments, lectures and readings from which our individual instructors could not benefit as much as we did. In that process, the diverse backgrounds that brought us to the school were slowly but surely supplanted by new and more powerful competencies and a shared vision of what design was about. Yet, despite the newly acquired perspectives, we remained a delightfully diverse group.

Students had fantastic stories to tell through which we learned to appreciate each other's uniqueness. I remember Aribert Vahlenbreder who had lived in Brazil relating to us his Voodoo experiences. Andries van Onck from The Netherlands told us how he tried to beat the Rorschach test to stay out of fighting in Indonesia with the Dutch navy and instead was assigned to military intelligence. Roland Lindner, a Swiss co-student, told us how he was taken «prisoner of war» during the obligatory summer maneuvers of the Swiss army. Excited to see Edgar Decurtins, another Swiss co-student, as the officer of the opposing unit, he greeted him by his first name, and was promptly condemned to solitary confinement. I recall Ferdinand Porsche, rarely attending the Grundlehre, but always impressing us with the latest experimental vehicles from his father's factory. Deborah Sussman, Fulbright student and former assistant to Charles Eames, bedazzled us with her slideshow of life in Mexico, implanting in me my lasting fascination for that country. Everyone brought unique stories to the mix but most important were the discussions of current issues in the Mensa and at the coffee bar, usually followed by playing soccer, chess or reading international newspapers.

About life at the school, I could tell stories of spontaneous parties, such as when Schlacke (a co-student, sorry I forgot his real name) about midnight went from door to door in the dormitory announcing that he had invited a band to play in the shower area. I could tell about the South American students who impressed me by roasting huge chunks of beef on vertical stakes in front of a bonfire in the courtyard near the *Mensa*, inviting us to a feast. I could tell about the annual *Faschingfests* that the first year students traditionally arranged, transforming the public space of the building complex into an entertainment paradise for friends of the HfG in the city of Ulm. I could tell about the uproar caused by a red dot that Karlheinz Allgayer, in protest of the general absence of color at the school, taped to his window. Its visibility from the outside caused written condemnations by Aicher, threatening forceful removal. I could tell about my discovering a secret entrance to the decaying Kuhberg fortress nearby and guiding several students through its underground chambers

until an arch collapsed on us hurting Anneliese Schaefer (now Ann Wolff). I could tell about the friendly but dramatic and very public abduction of Wolfgang Siol's bride, Doris Weller, a Secretary at the school and much liked by students, from the church in which they were just married. I could tell about excursions, for example, to an amazing multi-channel concert of electronic music by Stockhausen in Munich, or to the 1957 International Architecture Exhibit in Berlin—but others will no doubt dwell on these and many other memorable events.

I made many friends in Ulm, although moving to the United States following my studies there made it difficult to keep in touch. But after half a century, I am still in contact with many, meeting them in Germany, the United States, The Netherlands, Switzerland, Italy, Brazil and Japan whenever opportunities arise, and our conversations continue where we left off.

I feel the need to conclude the account of my first year at the school with a somewhat distressing experience. With accommodations scarce on the Kuhberg, during our first year of study we lived in the city of Ulm. Karl-Heinz Krug and I rented rooms previously occupied by Hans von Klier and Rido Busse. Living downtown brought us in contact with native Ulmers. I was thus shocked to learn from our landlady that Inge Aicher-Scholl had been one of two highest ranking leaders in Ulm's BDM (*Bund Deutscher Mädel*), the women's arm of the Hitler Youth, and tough and totally committed to its cause. In 1943, when her brother Hans and sister Sophie Scholl, were arrested in Munich for distributing the anti-Nazi leaflets of the *Weißer Rose*, and shortly thereafter executed for high treason, Inge Scholl, so we were told, took it very hard, unable to comprehend how her siblings could do this to her.

Mandatory *Sippenhaft*⁵ meant a five months of an easy prison sentence for Inge Scholl. After the war, this protected her from going through denazification procedures, qualified her as a victim of the Nazi regime, and enabled her to found the Geschwister Scholl Stiftung in memory of her siblings. While her post-war activities may well exonerate her past, now acting in the name of the victims of the very regime she served with such conviction troubled my idealized perception of the head of the school's foundation. For all I know, she never denounced her Nazi involvement.⁶ Obviously, history is never as black or white as it appears later and in print.

Interestingly, we never talked about much less critically examined the Nazi horrors that created the ground of the schools founding. I regret not having asked Inge Aicher-Scholl about it either. Everyone knew of her book, believed it, and went on looking into the future.

5 *Sippenhaft*, German for «the liability of all members of a family for the crimes of one»—also the title of a book she edited from letters between family members and friends written during that 1943 period: Inge Scholl (1993). *Sippenhaft*. Frankfurt: S. Fischer Verlag GmbH.

6 Curious about whether I was too naïve 50 years ago and overlooked this history, I reread *The White Rose*, op. cit., for what I should have known at that time. In it, I found only two laconic passages about Inge Scholl's Nazi involvement: On page 6, she describes the enthusiastic reception of Hitler's promises for Germany to justify: «It is not surprising that all of us ... joined the Hitler Youth ... with

Studio Work – Second to Fourth Years

During the three years following the basic course, students worked in one of four departments of the school, visual communication, architecture (*Bauen*) and information, I in the department of product design (*Produktform*). Compared with the basic course, which challenged us with different kinds of problems every couple of weeks, work in the product design department was slow. Gugelot and Zeischegg were busy running their studios and doing contract work for industrial clients. Bill was gone. Other professors were hired to fill the gap, but they too had offices elsewhere and commuted to Ulm for short engagements with students. Faculty took nominal charge of a cohort of students for one or two quarters. I worked first with Dieter Oestreich on a caliper, with Gugelot on the head of a drafting machine, with Georg Leowald on an oil burning home heater and again with Gugelot on my practical diploma work, designing a motor grader. Following are a few observations.

The product design faculty did not lecture and gave no formal presentations. Lectures and seminars were left to what I will call here the interdepartmental faculty.⁷ Contact between students and the product design faculty was limited to discussions within a cohort of students of their individual design projects. Most students picked their own project. Because much emphasis was placed on careful preparations for a design, students worked for relatively long periods on a single project. Although the design faculty had much to show for themselves—after designing several radios, Gugelot pioneered combinable electronic elements of stereo systems, now quite common, Zeischegg was known for technically clever forms, and Oestreich had several well received designs to his credit—faculty critique of students' work was unprepared, spontaneous, and without offering general design principles much less suggesting pertinent literature. These critiques could be devastating for some, but they taught us to justify everything we designed in functionalist terms, whether we talked about production, materials, use, culture, or economics. Meanings had no currency in Ulm

and expressions of feelings were ruled insufficient though emotional involvement was evident in the intensity of the discussions. The use of functionalist vocabulary distinguished the HfG from art academies, American styling, and crass commercialism.

Yet, there was no systematic effort to empirically validate our claims, no theory to address different dimensions of function and no methods for reconciling conflicting design requirements.⁸ Bill's above mentioned distinctions among functions survived only in parts. It was an unsystematic functionalism that we practiced and argued, one that could be stretched in all kinds of directions,⁹ somewhat arrogantly, I would say now. We thought we had all the answers and became proficient in arguing for and against any proposal, any solution, more so than in sketching, using color and forms, other than geometric ones.

Obviously, arguments occur in language. However, we—faculty and students—spoke without conceptualizing the rhetoric we used to propose and defend our designs. Fifty years after Ulm, one of the design principles that I formulated reads:

*The fate of artifacts is decided in language.*¹⁰

In Ulm, we practiced that evolutionary process without reflection: Good design was what survived our justifications in language.

The empirical evaluation of designs did not exclude pride, reputation and competition. For a memorable example, Hans Gugelot had designed a box spring for foam mattresses,¹¹ well before my time at Ulm, originally for students living on the schools premise but subsequently available commercially. It was a sheet of plywood with cuts from the sides to the center to add some flexibility under the weight of a sleeping person. A student, Willi Ritz, who was a superb carpenter by previous training, designed one functionally comparable to Gugelot's but consisting of a number of carefully crafted hardwood ribs, allowing flexibility to be more evenly distributed—so was the ergonomic claim—held together by a

body and soul.» And on page 45, she describes attending the state funeral of Field Marshal Erwin Rommel who died in October 1944: «Everyone in Ulm who owned a brown uniform ... was (called on) to attend ... I dodged past the flags ...» This funeral took place 20 months after Inge Scholl lost her siblings and 6 months before Ulm surrendered to the advancing U. S. Army. While the latter account of her participation in 1944 reads less enthusiastic, it was written to be published in 1952, well after the event! In her book *Sippenhaft*, her own edited letters reflect on life, family, and religious beliefs but contain not a word of doubt in the very regime that criminalized and executed her siblings. From what I learned since from various sources (Detlef Bald, Inge Jens, Jakob Knab, Christian Petry, Ruth-Hanna Sachs, René Spitz and others), she joined the Hitler Youth in 1934, at the age of 17, right after the Nazis came to power, and in the very year the *Wandervogel* was outlawed and *d. j. 1. 11* leaders were arrested all over Germany. Her writings do not mention having been a BDM Ringführerin, commanding half of Ulm's young women, nor the educational and organizational responsibilities she performed. Although her siblings and members of the White Rose kept her out of the loop, probably for good reason, she writes of them as if she did have access to their conversations, thoughts, and feelings. Several studies of this resistance movement have been published since her 1952 book. They question her celebration of the Scholl siblings at the expense of the other members of this resistance group and her lack of understanding the larger context in which this resistance emerged. But the story of how Inge Scholl converted from a tough BDM leader to the sister of martyrs still needs to be excavated. This is made difficult by her blocking public access to her 1932–1946 diaries

(http://www.ifz-muenchen.de/archiv/ed_474.pdf – accessed 2008.6.28). What she accomplished after the war may speak for itself. But it would have been an act of courage, minor by comparison with what her siblings died for, to say «I was wrong» or better still «in retrospect I am ashamed to have served that regime for so long.»

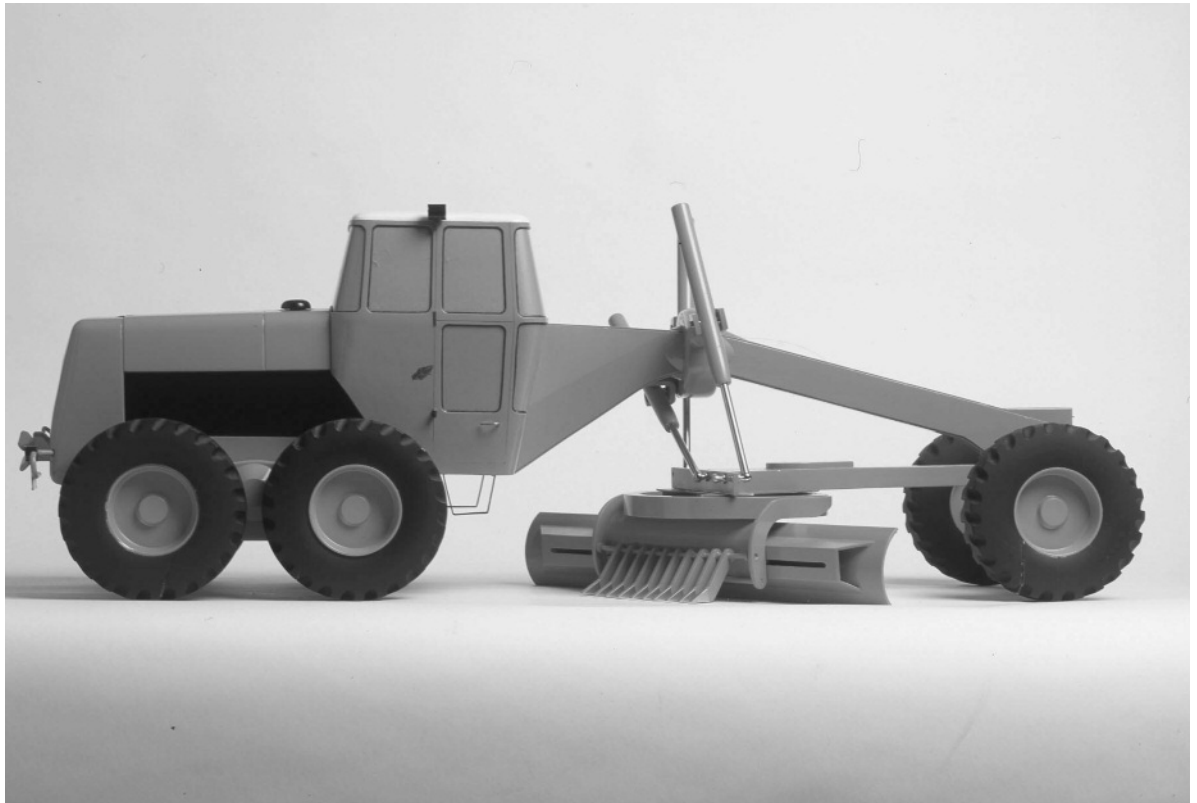
⁷ I am drawing a distinction between the design faculty, which was associated with particular departments—product design, visual communication, architecture, and information—and the interdepartmental faculty, which was not. In fact this distinction was more complicated, having to do with the terms of their employment contracts with the Geschwister Scholl Stiftung, including the ability to maintain their own studios, live in the faculty tract next to the school, and how central to the school their subjects were judged.

⁸ For example, as in the methodology promoted under the name of TRIZ, see Genrich Altshuller, Lec Shulyak, and Steven Rodman (Translators) (1997). *40 Principles: TRIZ Keys to Technical Innovation*. Worcester, MA: Technical Innovation Center.

⁹ See Jan Michl's discussion: «Form follows what?» <http://www.geocities.com/Athens/2360/jm-eng.fff-hai.html> (accessed 2008.6.6.)

¹⁰ *The Semantic Turn*. Op. cit. Page 148.

¹¹ Herbert Lindinger et al. (1991). *Ulm Design; The Morality of Objects*. Cambridge MA: MIT Press. Page 74.



center spine. Willi's design was more expensive to produce but also more elegant. Challenged by this design, Gugelot proceeded to jump on Willi's box spring, as on a trampoline, to see whether he could break it. Then Willi reciprocated, testing Gugelot's design the same way. The scene was reportedly hilarious, to which one must add that both were formidable characters. But behind the toughness of the test they behaved like competing kids and their audience had fun. (This happened while I was still in the basic course).

More seriously, at the HfG, there was also a strong preference for designing photogenic objects, attractive mini-sculptures, one may call them. In preparation of work on the above mentioned oil room heater, I visited a company that produced them. I conceived a new technology that would radically flatten the heater's normally cylindrical heating chamber. My aim was a heater that would be as unobtrusive as possible. I asked myself, why should every product be a prominent conversation piece and, in the case of a room heater, occupy valuable floor space in a living room? This resulted in a heater that could be hung on a wall. Its deliberately inconspicuous, flat, rectangular face panel, about four inches removed from that wall, hid its heating mechanism completely, but allowed its controls to be accessed from its side. Lewald, who supervised my project, did not see any virtue in

a deliberately unassuming form and questioned my approach. So, I developed a stand-alone version as well. To me, design did not need to be visually intrusive. Camouflaging everyday artifacts is a valid design objective.

The unquestioned requirement of creating visual records of our work and Ulm's photographic style amplified the preference for mini-sculptures. We embraced that style without reflection, not realizing that it shaped the direction a design would be taking. Today this style becomes apparent when one examines the collection of photographs published in HfG's retrospective.¹² The artifacts designed in Ulm were typically gray in color, photographed without color, mostly against white or neutral backgrounds, «clean,» «rational,» highlighting their abstract geometry through frontal, side and top views, ideally without perspective, and «objective,» i. e., shadowless and without context. In over 60 photographs of this retrospective, only two products are shown in use, one is the Ulm stool (*Hocker*) in a student apartment and with Bill lecturing,¹³ the other is Vahlenbreder's electric plug with a hand pulling it.¹⁴ Ulm's photography excluded the users of a design. From the photographic record of the designs by faculty and students at Ulm, it would seem that HfG designs were not meant for people. While we did argue for «the user,» that user was mainly our own abstraction, as if we could ignore their diversity, convinced they would learn the function

12 Ibid.

13 Ibid. Page 71.

14 Ibid. Page 83.

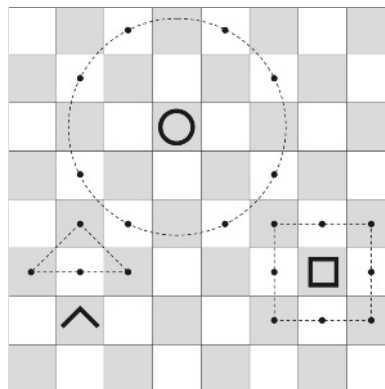
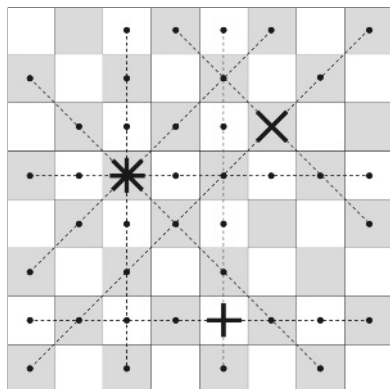
we had in mind. Ulm's photography reflects this attitude. Later, I sought to resurrect the neglected variety of users, their agency and intelligence, by conceptualizing networks of the stakeholders in a design.¹⁵

Designing the head of a drafting machine taught me another lesson that would become important to my subsequent interest in design. The mechanism of this design earned a German patent¹⁶ for integrating several controls into a single knob/handle. However, deviating from Ulm's stereotypic color preference for shades of gray, I risked giving that handle a bright yellow color. The color turned out to be less problematic than its context, its placement in the center of a white dial with a scale indicating different drawing angles. People had an unexpected gut rejection. Some explained their association of the combination of color and form with a fried egg. Indeed, who would want to work with an egg yolk in his or her hand? At that time, Aicher had succeeded in banning color theory from the curriculum of the HfG. I doubt that the color theory known at that time would have made a difference. But clearly, the unintended meaning my design triggered escaped functional arguments. We had no vocabulary to conceptualize such phenomena. Much later, they became of considerable interest to me, exploring them in terms of product semantics, the meanings that users bring to artifacts.

Besides the required work in the product design department, I pursued other developments of personal interest. I designed a camera for a manufacturer in Spain, investigated the support for a tiltable drawing table consisting of just two simple symmetrical tubular frames that affected the tilt of the table by moving them relative to each other, and developed chess figures that signaled the fields they controlled during play.¹⁷ Unlike the product design faculty, the workshop masters Hildinger, Otto Schild, Josef Schlecker and Siol were always available and willing to discuss challenging problems, largely of the model-building kind.

I do no longer recall how I came to my diploma project, a motor-grader. I visited the Eisenwerk Gebrüder Frisch in Augsburg, who produced construction equipment, including such graders. Its engineers were kind enough to brief on the problems encountered with their design. They were two; one was visibility of the various attachments from its driver's cabin while at work and the other was the vulnerability of the system of hydraulic controls under rough working conditions. I spent part of my fourth year to solve these problems and ended with technical drawings and a scale model of the grader.¹⁸ It was the physically largest product designed in Ulm at that time. Gugelot signed the result as my advisor. Since that final design was to be an independent piece of work, Gugelot trusted me enough to let me do what I wanted, not meeting me even once. In 1961, this design was awarded first prize by the Kulturkreis im Bundesverband der Deutschen Industrie.

Who was the most influential product design teacher for me? It was Bruce Archer, who joined the HfG faculty in 1960, right after I had completed my course work. He actually did give lectures; brought a design method to the department; was intensely involved with his students and open to explore alternative approaches. I was no longer a student when we met, but having just finished writing my thesis (see below) and being full of it, we soon discovered similar interest in design theory and methodology. From him I learned that the users of products were not the only ones that designers had to consider. There always are bystanders with opinions and influence, he insisted. Archer was not a sociologist but with this addition, he had recognized the social role of products. I stayed in contact with him, met him on a several occasions. He remained enthusiastic about my thesis and was kind enough to write the foreword for *The Semantic Turn*,¹⁹ incidentally sending it to me the day before he died.



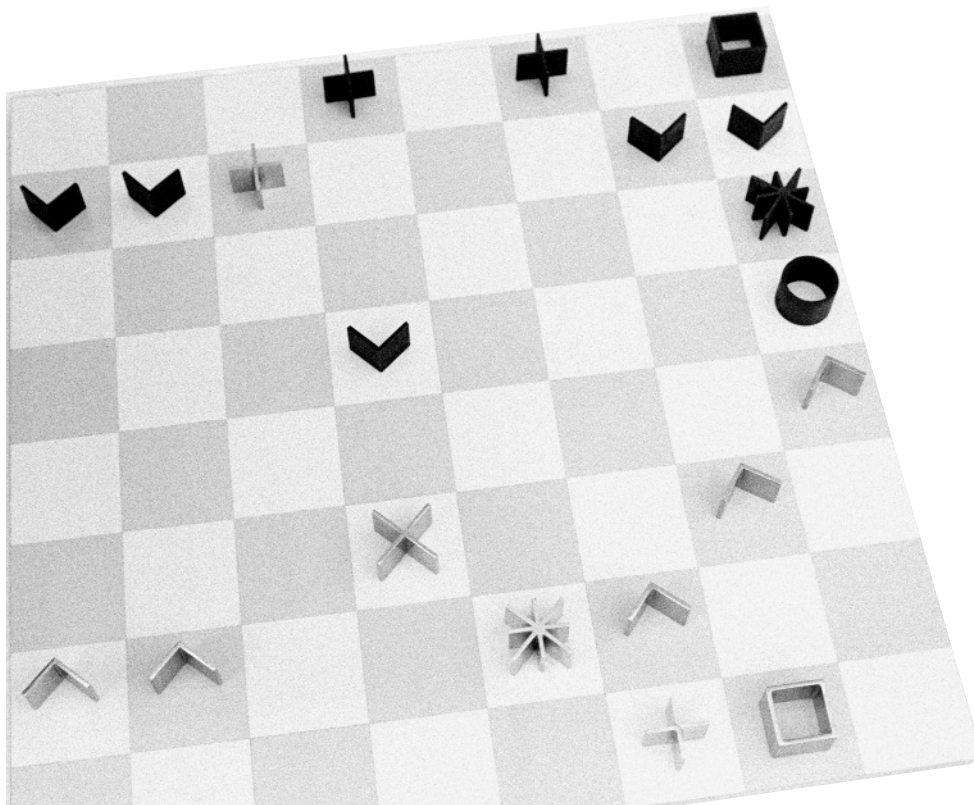
15 *The Semantic Turn*. Op. cit.

16 DBP 1113394

17 Described in *The Semantic Turn*. Op. cit. Pages 319–321.

18 I also enjoyed building a carrying box for that model, which matched the model in complexity and probably accounts for the fact that the model has survived to date.

19 Op. cit.

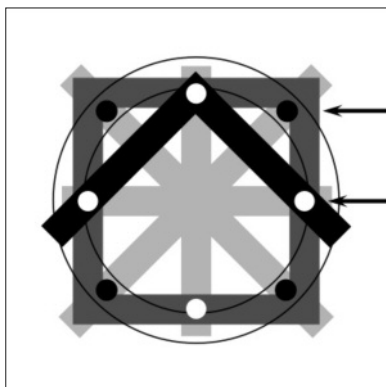


Chess game, 1960. The chess pieces visualize their possible moves

Below: Magnets of two polarities are inserted into pieces and chess board at intersections of (a) Queen, Bishop, and Knight, (b) Pawn, King, and Rook

Left: Correlation of the form of the chess pieces with what they control
 Directional pieces: Queen = Rook + Bishop
 Circumscribed pieces: Pawn, Knight, and King

Preceding page: Motor-Grader (model). Diploma project, HfG Ulm 1960



The position of magnets at intersections of

Queen
 Bishop
 Knight

Pawn
 King
 Rook

Intellectual Opportunities – All Four Years

The HfG Ulm offered a variety of regular courses, seminars and occasional lectures by the interdepartmental faculty, some permanently employed, some guest lecturers and many visitors. The student body was not very large and most curricular activities were open to everybody. The lack of conceptual substance in the product design department made the intellectual opportunities that the interdepartmental faculty offered more attractive and essential to what students talked about.

Looking over a copy of my transcript (*Testatbuch*) after 50 years had passed, the subjects taught during this period were quite amazing in breadth, including copyright and patent law, material science, theory of production, applied physiology, ergonomics, lighting techniques, theory of perception, history of art and design, cultural history, sociology, information theory, aesthetics, scientific methodology, and mathematical operation analysis. It is not surprising, therefore, that these subjects had considerable impact on how students approached practical design problems.

Until 1958, the philosopher Max Bense and his assistant, Elizabeth Walther, from the University of Stuttgart, taught scientific methodology and aesthetics at the school. Bense's unique information aesthetics, which I would characterize as a theory of cultural dynamics, sought to explain the experi-

ence that all cultural objects—designs, works of art, texts and musical compositions—lose their information-aesthetic value as they become more common, for example, by mass production. Cultures are kept alive by the continuous creation of newness, improbable configurations and unusual designs, all of which may be difficult to understand at first but become more acceptable in use. This was an attractive theory that gave the HfG a justification for its avant-garde ambitions. He also embraced a theory of signs, developed from C. S. Peirce's semiotics, later picked up by Maldonado.

Bense's scientific methodology was classificatory with a strong commitment to an objectivist epistemology. Faculty and students did not conduct observational studies and scientific experiments, however. Bense's philosophy added respectability to the HfG and created intellectual excitement, but did not impact design practices at the school. The year after Bill's departure, Bense decided to leave the school as well. In 1958, Horst Rittel was recruited to assume the position vacated by Bense and Walther. For me, Rittel would become the most influential teacher and mentor in Ulm. I might add in passing that most professors at the school were very young. Rittel, for example, exceeded me only by two years in age.

I vividly recall Rittel's first lecture on information theory, nominally geared to students in the department of information—students with mainly journalistic ambitions. At that point, he did not quite know the students he was facing. Unlike the philosopher Bense, the mathematician Rittel started the subject with probability theory, explained the properties of logarithms, and thus tried to develop information theory from the ground up. Whereas Bense and Walter had taught methodology as a philosophy of science, Rittel started with an empirical interpretation of methodology and talked about investigative techniques, statistical evidence and decision making. Rittel, just as Bense before him, was an enthusiastic teacher, but unlike Bense, who commuted from Stuttgart, Rittel lived on the Kuhberg, was younger and pragmatic in orientation. Learning fast, he soon understood design as a distinct paradigm, saw what was needed and proceeded to introduce into the curriculum methods that had direct implications on design activity: combinatorics, mathematical operations research, decision theory, systems theory, cybernetics, and planning theory. His teaching fueled the conversation of many students and influenced their approach to design, but came to be resented by the product design faculty, who occupied themselves with their own studio work, demonstrating their undoubted competences in designing exceptional products, but did not understand or care to inquire into where the students were heading.

Rittel was foremost a teacher. He opposed the distinction between intuitive and systematic design processes, not without acknowledging that intuition is always implicated in the choice and use of methods, but by insisting that only communicable processes can be taught and only explicitly stated activities can be scrutinized critically, evaluated and improved upon. Consequently, he developed tools for explicating design decisions, subsumed under a process that started with the definition of problems, proceeded to decisions among possible solutions, followed by prototyping and ended with evaluation. He found factual knowledge less interesting to teach than methods that enabled practitioners to find out what was needed and do something with it. He practiced his belief that learning to learn was more important than being trained in a particular practice or style. Rittel was not alone in encouraging the use of verifiable methods. Henry Bahrack taught human engineering for a year as a Fulbright scholar and introduced experimental techniques for evaluating ergonomic properties of designs. Herbert Schober taught physiology of visual perception followed by Merwyn W. («Bud») Perrine, who discussed social psychological variables of perception and introduced us to demonstrations in social perception. Rittel made their courses accessible by talking about statistical techniques for hypothesis testing and decision making under uncertainty, which underlies such empirical studies. But his real interests and strengths was the development of a vocabulary capable of aiding and enriching the understanding of design practices.

Bruce Archer, who taught at the HfG between 1960 and 1962, was the first to teach his own criterion-based design method to product design students. Rittel, full of ideas, and Archer with many years of experiences in the area of what I now call human-centered design, worked well together and later became major pillars of the design methods movement based largely in England.

In 1963, at which time the teaching climate at Ulm had become increasingly intolerable (see HfG Politics below), Rittel was invited to join the faculty at the University of California in Berkeley, where his work flourished in the form of a general theory of planning in urban environments, architecture and design, acknowledging the role of arguments in what he correctly identified as a basically political process of making design decision with what I now call stakeholders.

Rittel did not write much, and the few pieces he contributed to the literature were co-authored and appeared in odd journals or as technical reports. But his «Dilemmas in a General Theory of Planning»²⁰ proved to be a seminal treatise. There, he described the inherently intractable nature of design and planning problems, which he termed «wicked problems,» in contrast to the tame problems of mathematics,

chess, puzzle solving and engineering. After I had become a doctoral student of communication at the University of Illinois, studying with the cybernetician W. Ross Ashby, I visited him in Berkeley in 1964, I believe. At that time he saw planning as a rhetorical activity, creating defensible arguments for change—but I am getting ahead of my story.

Visitors played an important role in Ulm. They came by; curious about this new kind of school, gave lectures, and left their ideas behind. I heard Charles Eames speak and later visited him in Los Angeles. I saw S. I. Hayakawa and his disciple, Warren Robbins, promoting Count Korzybski's general semantics. I met Fritz Heider, learning only later how important his social psychology was in the United States and drew on his work. I heard Alexander Mitscherlich speak on the connection of art and psychiatry. I recall Buckminster Fuller, the inventor and proponent of geodesic domes, giving an unforgettable lecture. He came with two assistants and spoke on «My Image of the Universe ...» in an overcrowded room. He fascinated his audience with his enthusiasm, but speaking in English and using his notoriously idiosyncratic vocabulary, he was difficult to follow. I do not recall for how long his presentation was scheduled, but it seemed to never end. Students left for coffee, discussed what they had heard outside, and then went back, trying to make sense of «his universe.» Much later, «Bucky» ended up at the University of Pennsylvania where I teach. In 1961, I also had the opportunity to guide a group from Bertolt Brecht's Berliner Ensemble through the school. Paul Dessau was enthusiastic, recognizing Brechtian ideas in HfG's philosophy of stripping products of everyday life to their essences.

I should mention the library at the HfG, small by all standards but superbly stocked and kept up-to-date by the excellent librarian, Andrea Schmitz. It provided curricular and general reading material and featured international newspapers at a reading corner in the common area. However, we used each other's intellectual resources as well. For example, I once bought a used book from Dolf Zillmann containing a translation of Nikolai G. Chernyshevsky's dissertation,²¹ defended in 1855 at St. Petersburg University in Russia. Chernyshevsky was an early materialist who radically departed from universalist aesthetic theories.—In Ulm we relied on universalist claims, celebrating mathematical justifications of forms and arguing the functionality of our designs without reference to different user cultures and awareness of our own class biases.—Chernyshevsky, by contrast, tied aesthetic judgments to social realities and to the needs of the ruling elites to maintain their cultural privileges by imposing the ideals of their lifestyle on the population. Dolf was

more of a psychologist and remained so even after he became a colleague communication researcher, but Chernyshevsky's thesis resonated with my more sociological interest in design.²²

My Graduate Thesis (*Theoretische Diplomarbeit*)

To graduate, HfG students also had to write a thesis, a theoretic exploration of an issue related to design. Many combined this requirement with preparatory inquiries for their final design project. Influenced by theories of social perception and of information, I was interested in how people perceive the artifacts they use. With the idea that objects play important roles in social communication, acquire symbolic and sign qualities, I approached Tomás Maldonado, who had been promoting semiotics, largely in the visual communication department, for sponsoring my thesis. However, he told me that the idea of products having meanings was a categorical mistake. Signs, he insisted, refer to objects of use, but objects cannot serve as signs. I now know that this belief is fundamental to traditional semiotics, its two-world epistemology and unfortunate embrace of Bertrand Russell's theory of logical types,²³ but contradicts every day experiences. It became clear to me that I could not rely on semiotics as a framework for my explorations and that I would have to work with someone else. Rittel was more open to these ideas, so I worked with him instead. My thesis was titled «*About the Sign- and Symbol Characteristics of Objects; Toward a Theory of Signs for Programming the Forms of Products in Social Communication Structures.*»²⁴ Its subtitle, a mouthful of scientifically sounding abstractions, was intended to contextualize design in processes of human communication.

To justify my thesis, I drew a distinction, which I still maintain, between the technical functioning of a product—of concern largely to engineering—and the communicative role things play in every day life, suggesting the latter to be the defining interests of design generally. I was convinced that HfG's celebration of technology was wrong headed, confusing these two domains. This became the topic of the first article²⁵ I ever wrote. It was published in *Output*,²⁶ the student-run publication, which provided an intellectual alternative to the official and glitzy appearance the HfG presented to the world outside. Perhaps it is no accident that Richard Fischer, my contemporary in Ulm, subsequently theorized the sign-function of products²⁷ and Jochen Gros, a later Ulm graduate, wrote about the symbolic functions of products.²⁸ Both called for a product language (*Produktsprache*). For me, the ideas that I had developed in my thesis lay dormant for several years.

21 Nikolai G. Tschernyshevsky (1855). *Die Ästhetischen Beziehungen der Kunst zur Wirklichkeit*. Dissertation, St. Petersburg University, Russia. Pages 362–533; in N. G. Tschernyshevsky (1953). *Ausgewählte Philosophische Schriften*. Moskau: Verlag für fremdsprachige Literatur.

22 See my discussion of Chernyshevsky's thesis in *The Semantic Turn*. Op. cit. Pages 308–310.

23 *The Semantic Turn*, Op. cit. Pages 273–278, 305–308.

24 Klaus Krippendorff (1961). *Über den Zeichen- und Symbolcharakter von Gegenständen: Versuch zu einer Zeichentheorie für die Programmierung von Produktformen*

in sozialen Kommunikationsstrukturen. Ulm: Diploma Thesis. Hochschule für Gestaltung.

25 Klaus Krippendorff (1961). *Produktgestalter Kontra Konstrukteur*. *Output* 5+6: 18–21.

26 I took part in the conception of *Output* and suggested its name. Between 1961 and 1964, its editors, Gerhard Curdes, Susanne Eppinger, Renate Grünwald, Klaus Pfromm, and Ute von Seydlitz, joined later by others, managed to publish 25 issues. Today these issues constitute important documents of the intellectual and intern-political debates during that time.

27 Richard Fischer (1984). *Grundlagen einer Theorie*

Summers

The academic year of the school was divided into quarters. During the summer quarter, formal education was suspended. For two months in 1957, I worked for my former employer, the engineering consulting firm in Düsseldorf. It generated needed financial support for the following year. In the summer of 1958, I sought experiences in automobile manufacturing and interned at IVECO Magirus in Ulm. Then, in 1959, I wanted to learn English and, with the help of Maldonado and the British design historian, Reyner Banham, who had lectured at the school, I received an internship at a refrigerator manufacturer in Oxford, England. During the summer of 1960, as I was completing my practical design to graduate, Maldonado hired me to conduct ergonomic experiments on a typewriter keyboard that Ettore Sottsass was designing for Olivetti.

While in England I had two personally important experiences. One was meeting an alumnus of the Bauhaus, who worked at the design department of this Oxford manufacturer. I was delighted to find someone with obvious commonalities and eager to hear his stories. However, that designer had reconciled himself to being a draftsman, with few recollections, but the reverse expectations of wanting to hear all about Ulm, widely considered the Bauhaus' successor. We had many good conversations; he became something like a mentor for me in this company; however, I realized how easy it was to become framed by industrial structures and I knew what I had to avoid in my own future. I wanted to make a difference in the world, which is to me what design is all about.

Secondly, Oxford is a university town with closed colleges, public summer events and the famous Blackwell bookstore. As an outsider to university life, I spent my free time exploring the bookstore's shelves, catching up with the published news, but bought two books: W. Ross Ashby's *An Introduction to Cybernetics*²⁹ and Ludwig Wittgenstein's *Tractatus Logico-Philosophicus*.³⁰ I cannot say that I fully understood either of them at that time. Rittel had mentioned Ashby's work, Wittgenstein's *Tractatus* was written in German and English, printed side by side. Little did I know that I would be Ashby's student three years later and rediscover the Wittgenstein of his *Philosophical Investigations*³¹ twenty years after I had picked up his first book.

The Research Center for Visual Perception

After formally finishing my four year course of studies at the HfG Ulm and knowing that I would continue studying in the United States, I accepted a one year position as a research assistant at the newly established Research Center for Visual Perception (*Forschungsstelle für Optische Wahrnehmung*), headed by Bud Perrine. Two years before I started, Perrine had come to Ulm as a Fulbright scholar with a Ford grant to install the Adelbert Ames demonstrations of visual perception at the school. A psychologist, Klaus Wegner, a statistician, Dieter Betz, and I worked with Perrine on the recognizability of colors—the complement of existing studies of camouflage—supported by a grant from the German Fraunhofer-Gesellschaft. It generated several reports. I was involved in writing the third.³² New grants were in the approval stage when I left.

During its short existence, this Research Center encountered ideological opposition, notably from Aicher, who had no respect for scientific investigations and made clear that findings contradicting his expertise in color would not be tolerated.³³ There is no doubt, he was an outstanding graphic designer, but we were inquiring into perceptions by ordinary people that could have been the target population of his graphic designs. Maldonado was not so negative, occasionally consulting us on statistical matters. Then came a demand that the Center pay 100% overhead on research contracts to the Geschwister Scholl Stiftung, a rate that would have prevented it from being competitive with established research institutions in Germany and discriminated it against the design studios (development institutes). Perrine did not want to sign such a contract. But opposition to the Institute was also political. Depending on outside funding as well, the design faculty (Aicher, Gugelot, Zeischegg, Ohl, perhaps including Maldonado) could not quite see a research-oriented institute in their midst. Unbeknownst to us at that time, the design faculty was about to stage a coup, curbing the participation of the interdepartmental faculty in academic matters of the school, declaring the faculty that had their own design studios to be the school's core and therefore its sole decision making body. Whether in preparation for this coup, the Research Center for Visual Perception was forbidden to accept research contracts. The Geschwister Scholl Stiftung was unwilling or unable to finance it, leaving Perrine no choice but to leave in the fall of 1961. The Institute closed, losing the opportunity to conduct basic scientific research in an area that touched upon all of the school's departments.

der Produktsprache, Heft 3: Anzeichenfunktionen. Offenbach: HfG Offenbach.

28 Jochen Gros (1987). *Grundlagen einer Theorie der Produktsprache*, Heft 4: *Symbolfunktionen*. Offenbach: HfG Offenbach.

29 London: Chapman and Hall, 1956.

30 London: Kegan Paul, Trench, Trubner & Co. Ltd, 1947.

31 Ludwig Wittgenstein (1958). *Philosophical Investigations*. G. E. M. Branscombe, (Tr.), New York: Basil Blackwell & Mott, Ltd.

32 Mervyn W. Perrine, Klaus Wegner, & Klaus Krippendorff (1961). *Einfluß der Farbe auf die Erkennbarkeit und*

33 From a chapter titled «contaminated thinking» in Otl Aicher's (1985) *innenseiten des krieges*, Frankfurt: S. Fischer Verlag GmbH, I learned of a possible root of his anti-scientific attitude. He believed that «fascism overcame (Christian) metaphysics in favor of a scientific explanation of the world» and blamed causal thinking and Darwinism in science for the God-less excesses of fascism and Marxism (p. 21–27)—a confused string of abstractions.

HfG Politics

The HfG was plagued by numerous internal struggles. The first crisis I witnessed was due to the above-mentioned unexpected severing of the school's relationship with Bill, the school's principle architect, founder, first Rector and main attractor for many students. This crisis was mainly one among students. It created a vocal group of «Billists» and a minority loyal to the school's administration. I was not a Billist, but the way Bill was removed planted seeds of mistrust in the school's administration and the faculty that seemingly coluded with it.

Then came the increasing student dissatisfaction with the design faculty's lack of teaching and availability to consult on student projects—the departments other than product design may have been somewhat better served in this respect. I recall interesting studies of the resistance of logos to various disturbances, experiments with industrial building, and several visiting writers, for example Hans Magnus Enzensberger and Harry Pross, teaching in the information department. Product design students demanded more attention, access to design-related courses, exposure to basic principles of design, and had tense meetings with the *Rektoratskollegium*, the academic authority of the school consisting of three elected members of the permanent faculty, about this lack. The *Rektoratskollegium* was not entirely unresponsive, hiring several guest docents part time to teach technical drafting, material science, production techniques, physics and the like. This filled some gaps, but their presence did not make the product design faculty more accessible to us students.

An anecdote comes to mind: For a couple of years, I was the representative of the product design students and became involved in stressful negotiations with the *Rektoratskollegium*.³⁴ To succeed in one crucial meeting, one fellow student, Walter Dillis, gave me a pipe, tobacco and the instruction to take a puff before speaking. So I did and we all felt our case was heard. I kept smoking a pipe for the following fifteen years. Later I learned that there was precedence for Walter's advice. In 1947, when Bertolt Brecht was summoned before the U.S. House (of Representatives') Committee on Un-American Activities (HCUA), he too was told by a friend to smoke a cigar and take a puff or two before answering interrogatory questions. I have the soundtrack of his testimony and his answers were thoughtful and disarming.

All students are eager to learn. They are like sponges, open to absorb new ideas, more so than admiring creative authorities. With the design faculty largely unavailable, it was only natural that a majority of students was inspired by the intellectually challenging interdepartmental faculty who prepared their lectures, cared for students' intellectual

development, responded to their design problems and introduced cutting-edge ideas of future significance to design. For the design faculty, the above-mentioned guest professors did not pose intellectual challenges. They came and went and could also be dismissed on short notice, serving fairly department-specific and short-term needs. But the permanent interdepartmental faculty increasingly came to be perceived as a threat. This thread consisted of nothing other than what good teachers do, broaden the horizon of students into all kinds of directions—Hanno Kesting by entering sociological and social psychological perspectives into design considerations; Perrine by making the social perception of artifacts a key issue; Archer by teaching practice-oriented design method; and Rittel by introducing basic concepts and theories of operations research, systems, planning, decision making and, most importantly, teamwork. These topics proved useful in most of the school's departments, not just in product design, inspiring students to apply the newly gained insights to their practical exercises. It also encouraged students to ask new kinds of questions for which the design faculty, however, had no ready answers and no interest in finding them.

Outside the school, the design faculty continued to enjoy name recognition and ran profitable design studios on their public reputation. Having to share their voice with that of the interdepartmental faculty was one source of their resentment. In 1959, desperate because for the first time none of the product design faculty was democratically elected into the 1959–60 *Rektoratskollegium*, those left out (Zeischegg and Gugelot) proposed to replace that elected body in favor of a Rector, to be chosen from one of the departments. This laid the foundation for the subsequent silencing of the interdepartmental faculty. Perhaps seeing the writing on the wall, Rittel and the sociologist Kesting proposed a department for planning and organization at the HfG, but the idea did not come to fruition for reasons still unclear to me.

It made sense that, at least among students, the design faculty lost some of its authority to the interdepartmental faculty who brought new and exiting vocabularies to design. Instead of going with the flow and trying to understand where the design field and its students were heading, the design faculty interpreted this tension as caused by scientific ideas, deviously undermining design. There was of course no basis for this interpretation. The ideas of Rittel, Kesting, Archer, Perrine, and Archer had little in common with positivism, as alleged by Aicher, who knew little about philosophies of science. And those who appreciated their ideas created excellent work within the school and later became accomplished designers, professors of design related subjects, or made important contributions to adjacent fields. The schism of science versus design or theory versus practice, an old

34 Incidentally, after I became a student representative, my stipend from the Geschwister Scholl Stiftung was reduced from DM 400 to DM 100 per annum. At that time, monthly costs were: DM 40 for tuition plus DM 5 for insurance plus between DM 150–170 for room and board, payable quarterly. HfG tuition amounted to about US\$100 per academic year. Although Princeton University was in a different league, its graduate student tuition was \$1250 at my time there.

cultural stereotype invoked by the design faculty, served the latter as a convenient cover for being intellectually marginalized and losing some of the respect they thought entitled. True, a few students and some secondary literature about the HfG Ulm echo this fiction and cite it as a cause of the school's eventual demise. However, this distinction had no merit in Ulm other than as a political scapegoat. While Maldonado had interpreted the post-Bill era as one in which science would be incorporated into design considerations and contributed his version of semiotics to this effort, by now siding with the design faculty, he betrayed his erstwhile vision for the School for political benefits.

Perhaps one factor of this tension was that Inge Aicher-Scholl, Otl Aicher, and Maldonado had no graduate degrees, and Gugelot, Ohl, and Zeischegg came from academy of art/*fachhochschule* traditions that provided few if any models for how a university with diverse intellectual approaches worked. Later, I learned to appreciate the kind of academic discipline and openness for public debate that graduate education at good universities encourages but fine art and technical education may not value as much. Perhaps the lack of appreciation of the virtues of higher education by the design faculty explains at least part of its shortsighted politics.

After I left Ulm, HfG politics revealed its true face. In 1962, the design faculty conspired with the Geschwister School Stiftung to adopt a new constitution that denied the interdepartmental faculty tenure and a voice in the academic affairs of the school.³⁵ It became clear that vested interest in maintaining their lucrative studios and public visibility at the expense of the school's larger educational mission had all along fuelled and continued to be the determinant of many of the school's internal struggles. Students who suffered most from these political struggles revolted. As it behooves an avant-garde institution, their revolt anticipated by six years the 1968 student uprisings, which spread throughout Europe. As already mentioned, in 1963, Rittel left for the University of California in Berkeley. The bad academic climate that HfG politics had created left little room for the synergy that creative teachers need. It caused the school to limp to its end.

It is convenient for those involved to blame the government of the State of Baden-Württemberg for the school's mere fifteen years existence, as rearticulated by Gui Bonsiepe.³⁶ Indeed, that government did deny critical funding for the HfG, which was decisive in the 1968 closing of the school. I learned from Karl-Heinz Krug that some lawmakers now regret their decision. However, the seeds of the school's demise were planted and nourished long before its unfortunate termination. Surely, the personalities of Bill, Maldonado, Aicher and Inge Aicher-Scholl had something to do with it. But their petty power struggles and their inability to appreci-

ate the emerging design principles, practices and methods, and to assume a broader conception of design, which the interdepartmental faculty developed, prevented the HfG from staying on its avant-garde course. Perhaps the mission of the school was too far ahead of its time for its faculty to realize their part in the HfG's contribution to design, still felt all over the world. I have not seen a design school or university comparable to the HfG Ulm in scope and vision ever since, only a few highly specialized centers of excellence.

I was fortunate to be a student at the HfG, perhaps at its best time, and to find several of my lasting interests and my own trajectory there, but I am sad that contemporary design students cannot enjoy similar opportunities.



35 See René Spitz (2002). *The Political History of the Ulm School of Design, 1953–1968*. Berlin/Stuttgart: Axel Menges.

36 Gui Bonsiepe (2003). *hfg ulm / an open letter to a historian*. *Form+Zweck*, 20:9–11.

Early Experiences in the United States

In the fall of 1961, I entered the United States on the steamship *Bremen* with a Fulbright Travel Grant and a Ford International Fellowship. My hope was to study the subjects that had fascinated me in Ulm, most of which had originated in the United States, notably cybernetics, information theory, systems theory, social perception and symbolic interactionism. My fellowship brought me into the psychology department at Princeton University. This decision had been made by the Institute of International Education in New York. I soon learned that my background in design and eclectic interests was considered not an easy fit with U.S. universities. A glowing recommendation by Perrine, a recent Ph.D. graduate from Princeton University, was taken as a clue that I might like it there as well.

Unfortunately, since Perrine had graduated, this department had been taken over by rat psychologists. After a picture of me was published in *The Daily Princetonian*, standing in front of rat cages, subtitled, «Klaus Krippendorff, a German psychologist ...» I saw no future there and took my Volkswagen Bug in search of a more suitable environment. The former chair of Princeton's psychology department, Hadley Cantril, a well known social psychologist and completely sympathetic to my plight, gave me a list of names of people to visit during the Christmas break, including Jerome Bruner and George Miller at Harvard's Center for Cognitive Studies, the systems theorist Anatol Rapoport at Michigan University, and the media researcher George Gerbner at the University of Illinois—all of them scholars whose work I later learned to admire. The design departments I visited on my trip felt like intellectual deserts by comparison to what Ulm had offered at my time. The department of communication at Michigan State University, to which Martin Krampen, then living in Pittsburgh, directed my attention, offered me an assistantship, partly because Elke Koch-Weser and Krampen, former Ulm graduates, had left good impressions there. Instead, I enrolled in the interdisciplinary Institute of Communication Research at the University of Illinois in Urbana-Champaign. Communication studies made sense to me as my Ulm thesis sought to contextualize artifacts in human communication. The interdisciplinary nature of this educational program was important for me as it allowed me to study with cultural anthropologists, linguists, social psychologists, sociologists and mass communication researchers. The most important attractor, however, was the unanticipated presence of W. Ross Ashby, the British cybernetician, whose book I carried with me since my summer in Oxford. He taught cybernetics and was part of the Biological Computer Laboratory of Heinz von Foerster, who became a mentor to me as well. Looking back on my decision, I merely let the many seeds planted in Ulm grow in this new environment.

Academic Career as Communication Scholar

Because design was not a serious academic subject in U.S. universities as far as I could see, and my Ulm thesis concerned the role of artifacts in human communication, it was natural to become attracted to the emerging field of communication research. In 1967, I earned my doctorate in communication from the University of Illinois. But well before I had completed my Ph.D. dissertation, in 1964, the University of Pennsylvania, an Ivy League university in Philadelphia, offered me a job to help George Gerbner transform its Annenberg School for Communication into a respectable academic institution.

In 1964, I was surprised to receive Otl Aicher's invitation to come back to Ulm, but I had just made other plans. In 1971, Harry Pross, who had taught at Ulm as well, invited me to join the Free University in Berlin. I taught there for the summer but decided against moving. Jürgen Habermas invited me to lecture in his seminar in Frankfurt. I taught at the Institute for Bedrijfskunde in Delft, The Ohio State University, and the University of New Hampshire, made a short appearance at the East-West Center in Honolulu, Hawaii, and spent a year at The Netherlands Institute for Advanced Studies (NIAS)—all exciting engagements with different approaches to communication studies, but the University of Pennsylvania remained my home.

I contributed to academic research by authoring over a hundred articles and book chapters on communication theory, cybernetics, systems theory, social science methodology, content analysis in particular, and design issues. Early on, I extended Shannon's information theory to a method for analyzing complex systems with circular communication flows.³⁷ This was a continuation of my work with Ashby but can be traced to albeit rudimentary ideas I first heard of in Ulm. My dissertation evolved into a widely used textbook on content analysis, translated into Italian, Japanese, Spanish, and Hungarian and earning an outstanding book award. It recently appeared as a second and expanded edition,³⁸ and it is currently being translated into Chinese. I authored or edited several books on other topics.³⁹ Two books just came off the press.⁴⁰ I also designed a reliability statistics, known as «Krippendorff's Alpha.»⁴¹

I served as President of the International Communication Association (ICA); founded and chaired the International Federation of Communication Associations; am an elected fellow of several academic institutions, among them the American Association for the Advancement of Science, ICA and NIAS; received an endowed professorship named after Gregory Bateson, with the subtitle «for cybernetics, language and culture,» which describes my academic interests in general terms. The American Society for Cybernetics awarded me the Norbert Wiener Medal for my contributions

37 Klaus Krippendorff (1986). *Information Theory: Structural Models for Qualitative Data*; Beverly Hills CA: Sage; – (2009 in press). Ross Ashby's Information Theory: A Bit of History, Some Solutions to Problems, and What We Face Today. *International Journal of General Systems* 38,2.

38 Klaus Krippendorff (1980). *Content Analysis: An Introduction to its Methodology*. Beverly Hills CA: Sage; – (2004). *Content Analysis, An Introduction to Its Methodology*. 2nd Edition. Thousand Oaks, CA: Sage;

39 Klaus Krippendorff (2006). *The Semantic Turn; A New Foundation for Design*. Op. cit.

– (Ed.) (1979). *Communication and Control in Society*.

New York: Gordon and Breach;

– (1986). *A Dictionary of Cybernetics*. Norfolk VA: The American Society for Cybernetics—its entries are also available at: <http://pespmc1.vub.ac.be/ASC/INDEXASC.html> (accessed 2008.7.23);

– (Ed.) (1997). *Design in the Age of Information, A Report to the National Science Foundation (NSF)*. Raleigh, NC: Design Research Laboratory, School of Design, North Carolina State University; http://repository.upenn.edu/asc_papers/96 (accessed 2008.7.22);

– with George Gerbner, et al. (Eds.) (1969). *The Analysis of Communication Content; Developments in Scientific*

to cybernetics and the German societies for cybernetics and information pedagogic granted me a similar recognition. I am serving on the editorial boards of numerous academic journals and still enjoy teaching at the University of Pennsylvania's Annenberg School for Communication. I am sketching these involvements to say where I left most of my footprints.⁴²

Reentering Design, Product Semantics and The Semantic Turn

While my career as communication scholar unfolded, I preserved my contacts with the design community. With the department of industrial design at The Ohio State University (OSU) in particular, I have had a long relationship. In 1974, Charles Wallschlaeger, Chair of the department, and Nick Roericht, a former Ulm graduate and then guest professor there, brought their students to a conference on cybernetics⁴³ that I organized in Philadelphia. Reinhart Butter, who succeeded Nick at OSU, invited me on several occasions to give talks and teach seminars, bringing the department of communication together with that of design. Reinhart had kept a copy of my Ulm thesis and frequently nudged me to do something with it. This opportunity came in 1984 when Reinhart had a sabbatical leave. We wrote an article on what we called product semantics⁴⁴ and edited a special issue⁴⁵ on that topic for the Industrial Designers Society of America (IDSA)'s journal *Innovation*. This was the first time the word «product semantics» appeared in print and became a concept. At this writing, Googling «product semantics» scores over 10,000 hits!⁴⁶

Following this publication, IDSA invited us, plus Michael McCoy and John Rheinfrank, to organize a workshop at the Cranbrook Academy of Art and present our ideas. Uri Friedländer joined us there as well. Then, Robert Blaich, who had heard of the IDSA event, summoned his Philips designers from all over the world for a similar workshop in Eindhoven, which was to shape and did indeed define Philips's Corporate Design future. In 1987, during a sabbatical leave from the University of Pennsylvania, I taught at OSU and became involved in the Experimental Design Laboratory at RichardsonSmith, led by John Rheinfrank, thereafter consulting with them for several years on computer interfaces and other advanced projects.

By that time, the formula «Design is making sense of things» and the axiom of human-centered design:

Humans do not respond to the physical properties of things, but to what they mean to them

had found worldwide resonance. In 1987, the Indian Institute for Technology invited design practitioners and scholars to a conference called *Arthaya*, an ancient Hindi word for mean-

ing. Multicultural India with its rich mythologies embraced the semantic turn in design with open arms as it encouraged designers to respond to culturally diverse users, whom we failed to acknowledge in Ulm. In 1989, Reinhart Butter and I edited a double issue of *Design Issues* to which I contributed a chapter.⁴⁷ It defined our non-semiotic theory of meaning for artifacts more clearly than we were able to articulate before. For us and at that time, product semantics was two-pronged approach: (1) a systematic inquiry into how people attribute meanings to artifacts and interact with them accordingly, and (2) a vocabulary and methodology for designing artifacts in view of the meanings they could acquire for their users and the communities of their stakeholders.

This 1989 publication came just in time for the first of several European conferences and workshops on product semantics at the University of Art and Design in Helsinki, followed by similar workshops in Taiwan, Switzerland, Germany, Mexico, Brazil and Japan. For a couple of semesters, starting in 1993 when on sabbatical leave from the University of Pennsylvania, I also taught semantics of design at Philadelphia's University of the Arts. It resulted in a student-generated workbook,⁴⁸ used elsewhere as well. In 1994, the Club off Ulm invited Reinhart and me to present our ideas in the space of the former HfG. In 1996, the U.S. National Science Foundation invited designers to develop a roadmap for *Design in the Age of Information*⁴⁹ in which human interactive and semantic concerns had the highest priority.

Following this amazing acceptance of product semantics, I began to codify the design principles, methods and evaluative criteria that Reinhart and others we met along our journey had tested and were successfully applying. In so doing, it became clear that design concerns were rapidly migrating to new areas of human significance, not previously embraced. This called for expanding our original concept of meaning to the design of all kinds of interfaces with technology; multi-user systems such as libraries or educational systems; projects such as election campaigns or policy initiatives; and discourses. This emerging trajectory of design concerns addressed artifacts that were increasingly interactive, virtual and language-like. Creating concepts and vocabularies for designers to talk about their design practices and organize their work, design discourse for short, amounts to *redesigning design* in effect I would now say that any community that so reflects on itself gains considerable adaptive strength. In view of these new design concerns, reference to «products», a category of the industrial era, as in «product design», «*produktform*», and «product semantics», had to give way to «human-centered design» or «design semantics.» All of these reconceptualizations culminated in the above mentioned book, *The Semantic Turn; A New Foundation for*

Theories and Computer Techniques. New York: John Wiley.

40 Klaus Krippendorff (2008). *On Communicating; Otherness, Meaning, and Information*. Fernando Bermejo (Ed.). New York: Routledge; – with Mary A. Bock (Eds.) (2009). *The Content Analysis Reader*. Thousand Oaks CA: Sage Publications.

41 See <http://www.asc.upenn.edu/usr/krippendorff/dogs.html> (accessed 2008.7.22)

42 For my curriculum vitae see <http://www.asc.upenn.edu/usr/krippendorff/> (accessed 2008.7.22).

43 *Communication and Control in Society*. Op. cit.

44 Klaus Krippendorff & Reinhart Butter (1984). Explor-

ing the Symbolic Qualities of Form. *Innovations* 3,2:4–9.

45 Klaus Krippendorff & Reinhart Butter (Eds.) (1984). Special Issue on Product Semantics. *Innovations* 3,2.

46 On 2008.7.22, «product semantics» googled 10,400 hits. Yahoo found 16,300 documents on the Web.

47 Klaus Krippendorff (1989). «On the Essential Contexts of Artifacts» or on the Proposition that «Design is Making Sense (of Things)». *Design Issues* 5,2:9–39.

Reprinted in V. Margolin & R. Buchanan (Eds.) (1995). *The Idea of Design*. Cambridge MA: MIT Press.

48 Klaus Krippendorff (Summer 1994). *Design: A Discourse on Meaning. A Workbook*. Philadelphia PA:

Design, published in 2006, to which Reinhart Butter and others contributed illustrations and practical examples.

The Semantic Turn, now being translated into Japanese and German, provides a history of product semantics and a conceptual introduction to human-centered design, particularly overcoming the technology-centered functionalism of the HfG Ulm. It develops four novel theories of how artifacts could mean something: artifacts in use, in language, in their life cycles and in an ecology of other artifacts. It argues the case for a science for design, outlining various proven human-centered design methods, and proposes ways to validate the claims that designers need to make to make their designs compelling. The redesign of design it urges relies heavily on creating a productive design discourse that could make design as strong as the more established disciplines (see the section on Social Construction for reasons to make language its key). In its last chapter, I enjoyed exploring whether and how much of the semantic turn was anticipated in Ulm. To answer this question, I reviewed Bill's functionalism, Bense's information philosophy, Maldonado's semiotics, Chernyshevsky's political economy of aesthetics, Rittel's methodology and several barriers to considerations of meaning. Let me reproduce the two concluding paragraphs of the book:

Despite Ulm's blind spot for meanings, the semantic turn does not oppose Ulm's values. It could be considered a radical reformulation of the Ulm School's moral mission, which moves design into what was then an unarticulated domain ...: The design of meaningful human interfaces with technology. Some of Ulm's esteemed virtues reappear in the well-known qualities of human communication: clarity, economy, expressivity and informativeness, but now conceptualized in interactive and culture sensitive terms. While the semantic turn creates new options for design, it does not endorse arbitrariness, meaninglessness, or dishonesty either. By playing on the now dated design principle «form follows function,» the semantic turn offers designers a new covenant:

Interfaces follow recognizable meanings.

The semantic turn acknowledges design as a fundamental human right, the right to construct one's own world, interact with fellow beings in theirs, and make contributions to the ecology of humanly accessible artifacts. It is a matter of ethics to acknowledge multiple stakeholders in design, but it is a matter of survival for the design profession to make design discourse—the language that creates possibilities and proposes collaboratively realizable futures—methodologically sound, easy to use and accessible to everyone who cares to exercise their right to design. With this in mind, this book starts a new foundation for design.⁵⁰



Social Construction

If in *The Semantic Turn* I applied my social scientific insights about human communication to design, my education at Ulm and subsequent design experiences undoubtedly fertilized my contributions to the social sciences. Straddling several disciplines (cybernetics, dialogue, cultural anthropology, communication scholarship and design) is to me the greatest source of inspiration and I have never been so absorbed in any one so as to become trapped in its conceptions.

In conversations with my fellow social scientists, I contend that much of social research is still conducted in the spirit of the enlightenment: finding theories of what exists with evidence collected in the past—not what could be changed or reconstructed. Investigations of society are always behind what social reformers, visionary poets, and designers affect. Scientific predictions of technological developments are notoriously wrong precisely because *design always changes the world as we speak*. When working at the Experimental Design Laboratory, we speculated that what we settled there by design would be studied by academics twenty years later, and it is.

In conversations with my fellow designers, I argue that blindly relying on scientific research as a premise for design confines and can seriously undermine designers' ability to innovate and change the reality we know.⁵¹ For me, design-

University of the Arts.

49 *Design in the Age of Information*. Op. cit.

50 *Ibid.* Page 322.

51 Klaus Krippendorff (2007). *Design Research, An Oxymoron?* Pages 67–80 in Ralf Michel (Ed.). *Design Research; Essays and Selected Projects*. Zürich: Birkhäuser Verlag. See also in *The Semantic Turn*. Op. cit. Pages 27–28.

52 E.g., Klaus Krippendorff (1993). *Major Metaphors of Communication and some Constructivist Reflections on their Use*. *Cybernetics & Human Knowing* 2,1:3–25.

53 Pages 95–102, 166–169 in Klaus Krippendorff (2006). *The Semantic Turn*. Op. cit.

54 George Lakoff and Mark Johnson (1980). *Metaphors We Live By*. Chicago IL: University of Chicago Press; – (1987). *Women, Fire, and Dangerous Things*. Chicago IL: University of Chicago Press.

55 Nietzsche, Friedrich (1954). On truth and lying in an extra-moral sense. Pages 42–47 in Walter Kaufmann (Ed. & Tr.). *The Portable Nietzsche*. Harmondsworth: Penguin.

56 Ludwig Wittgenstein (1958). *Philosophical Investigations*. Op. cit.

57 Richard Rorty (Ed.) (1970). *The Linguistic Turn; Recent Essays in Philosophical Method*. Chicago IL: University of Chicago Press; – (1989). *Contingency, Irony,*

ers always need to ask whether what presently exists is worth keeping; question what people take for granted, believe cannot be done, or are not willing to change; and create possibilities for future ways of life that would not come about naturally. Critical interrogations of existing certainties, I argue, must not stop at scientific findings. History is full of examples of scientific theories that are accepted at one time and proven invalid at a later time, often due to designers who dared to try new things. True innovations are not predictable by scientific means. They are antithetical to the stabilities that scientists theorize.

My point of entry into both debates is our use of language. Designers should know that speaking, writing, and sketching are not restricted to representing facts. They can reach into the future and realize what talk, text, and images present as mere possibilities. Inquiries into the use of metaphors—in everyday talk⁵² as well as in design⁵³—led me to realize that metaphors are not innocent figures of speech or optional poetic embellishments. They unwittingly alter their users' perception of reality and direct their actions accordingly.⁵⁴ This gels with Friedrich Nietzsche's conception of language as a mobile army of metaphors.⁵⁵ To me, understanding how metaphors work is part of the larger linguistic turn in philosophy, initiated by Ludwig Wittgenstein⁵⁶ who, moving away from his earlier *Tractatus*, gave up on the common conception of language as depicting reality and began to explore language as a social practice, as doing something in the world. Richard Rorty⁵⁷ further radicalized the linguistic turn, suggesting that it is new vocabularies that create new realities. Interestingly, Rittel's insistence, subsequent to his teaching in Ulm, that «planning consists of making defensible arguments» fits right into this linguistic turn, perhaps with less radical intentions. Obviously, all designs and all plans occur first in language. Making them available to act on what they describe change reality. Similarly, creating social theories and communicating them, including to those theorized therein, can change their validity right in front of the theorists' eyes.⁵⁸ In view of these observations, I contend that creating and publishing social theories entails responsibilities similar to those that designers must assume for what their designs do in the world.

To me, the conception of reality that the linguistic turn has ushered in morphed into social constructivism.⁵⁹ Naturally, as a designer, I am predisposed to seeing and conceptualizing communication as a constructive process rather than as a representational one. Constructivism favors conceiving social organizations as networks of conversations among stakeholders in which realities are negotiated, commitments are made, and actions are coordinated. It sheds light on how power relations are constructed, maintained, and may be challenged. It encourages new vocabularies that aid eman-

ation from various kinds of oppression—racial, gender, state, institutional, ideological, but also interpersonal—whether through (talk) therapy, political action, or by design. Above all, whereas the enlightenment saw scientists in the position of detached spectators, social constructivists and second-order cyberneticians see themselves as *participants in the very realities they talk about but unwittingly construct or bring forth*. In this view, scientists come to be seen as designers of reality, not as its accountants. I have contributed to this genre of social science literature, and a book of collected papers, written from this perspective, was just published.⁶⁰

To sum up my «off Ulm» stance: As a designer, I am committed to make a difference in the world. As a teacher, I try to challenge students to do likewise. As a communication scholar, I hope to make my colleagues aware of how they participate in languaging their realities into being. As a cosmopolitan, I cherish cultural diversity and chide universalism. As a critical scholar, I question truth claims, experiment with what others think impossible, am suspicious of convenient facts, and unflinchingly challenge self-assured authorities. In these regards, I have remained a designer in whatever I do, always exploring what can be improved and suggesting alternatives. To me, questioning whether things need to be the way they are, applying multiple perspectives, and listening to the deprived voices of others are ways to open possibilities for new constructions of reality. Without applying these critical methods, I suggest, life becomes stale and conventional, and design disappears.⁶¹

I am proud to trace my communication scholarship, social constructivism, and work in cybernetics to my formative years at the Hochschule für Gestaltung in Ulm fifty years ago. Without that avant-garde spirit, the people I met, the friendships I maintained, the experiences we shared, and the conversations I continue to have with them, I have no clue where I would be today.

and *Solidarity*. New York: Cambridge University Press.

58 Klaus Krippendorff (1996). A second-order cybernetics of otherness. *Systems Research* 13,3:311–328 (contribution to a festschrift for Heinz von Foerster).

59 For the earliest proponents of this approach see the sociologists Peter L. Berger and Thomas Luckmann (1966). *The Social Construction of Reality; A Treaty in the Sociology of Knowledge*. Garden City NY: Doubleday.—More recently: Paul Watzlawick (Ed.) (1984). *The Invented Reality*. New York: Norton and Co.—For a less radical formulation: John Searle (1995). *The Social Construction of Reality*. New York: The Free Press.—And the educational

psychologist: Ernst von Glasersfeld (1995). *Radical Constructivism*. Washington DC: The Falmer Press.—

I do not subscribe to «-isms» but the body of writing cited here has much to offer.

60 *On Communicating*. Op. cit.

61 The cultural dynamics set in motion by design practices which are necessarily unconventional might find support in some of Max Beckynse's ideas developed in his information aesthetics. These almost-forgotten ideas may well be worth revisiting, now from the perspective of a rapidly emerging information society.