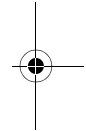
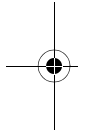


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2. Education

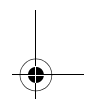
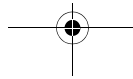
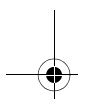
THE PARADOX OF EDUCATION

POERKSEN: Immanuel Kant writes in his essay *Über Pädagogik* that the wide field of education is governed by a fundamental paradox. On the one hand, we want free and self-determined individuals to leave our schools, on the other we impose a syllabus on the future individuals, force them to attend schools, punish their failures, and persecute their non-compliance. There is, if we follow Kant, an inescapable relationship of tension between the goals and the means of educational efforts: They contradict each other. Would you agree?



MATURANA: No. Education, the commentary of an observer, is the process of transformation resulting from the co-existence with adults. We become the adults we have been living with. This means: If freedom and self-determined thinking are the goals of educational activity, then we have to live together in a way that is supported by the mutual respect for the autonomy of the other. In my view, the paradox formulated by Kant does not exist at all. The way of life, the manner of living together, shape and transform people. If you want to teach autonomy and reflection, you cannot use force as a method but must create an open space for communal reflection and action. There must be no contradiction between goals and means.

POERKSEN: Surely, there must also be constraints? It must be laid down when everybody has to be present, what the task is, who the teacher is, who has authority.

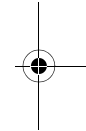
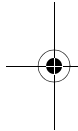




MATURANA: Compulsion will emerge if the teachers do not succeed in presenting their material in a thrilling way and in making school an attractive place of being together. Their failure will lead to force.

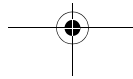
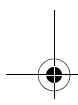
POERKSEN: The teacher is totally responsible for everything that may happen in school. Is this not an exaggerated claim?

MATURANA: No. If a teacher behaves respectfully, if he does not intimidate his pupils, if he listens, encourages cooperation and reflection, then a special form of interaction will emerge. The way of living practised by the teacher, including the goals of teaching, will be the source of profitable learning for the pupils. This also implies that three questions and tasks must be sorted out cooperatively in education. First it seems necessary to me to debate the educational ideal to be chosen – what should the future adults be like when leaving the school one day? Should they be democratically minded and responsibly acting citizens? Or are they to be authoritarian and commandeering hierarchs, *lords* who feel superior to everyone else? It is then necessary to anchor a way of life in the school that permits acting and thinking according to that ideal. Finally, there is the essential task of preparing the teachers for their job in such a way as to do justice to the desired goals – to enable them to live what they have to achieve.



POERKSEN: This would mean that teaching has nothing to do with the step-by-step elimination of ignorance, as is commonly thought. The transmission of knowledge is secondary. The primary requirement is a way of life that corresponds with one's ideals, a particular form of living together, out of which the material topics will arise in due course.

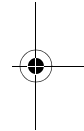
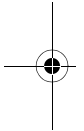
MATURANA: Exactly. The children do not learn mathematics in school, they learn how to live together with a mathematics teacher. Perhaps they will one day carry on this enjoyable and exciting kind of being together independently – and become maths teachers or mathematicians themselves. Teachers do not simply transmit some content; they acquaint their pupils with a way of living. In the process, the rules of arithmetic, the laws of physics, or the grammar of a language will be acquired. My claim is: *Pupils learn teachers.*





POERKSEN: What about children who systematically refuse to cooperate? What is to be done with them? The classical answer is, of course: bad marks, relegation, exclusion from the winning circles.

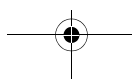
MATURANA: The so-called difficult children about whom teachers keep complaining often only struggle to be seen and accepted while the whole world expects them to behave in a calculable manner and to adapt to strange demands. Asking these children what they would like to do opens up space for an exchange and the children will give up their resistance. It is profoundly healing to be actually seen, to regain self-respect, and to participate in interactions supported by love. Some pupils probably turn away because the kind of teaching offered appears useless and boring to them. If the father is a bricklayer and the son is destined for the same trade – why should he waste his time on advanced algebra? Such an assessment on the part of the pupils is a challenge to the skills of the teacher who must now prove that the activity of a bricklayer can sensibly be connected with higher mathematics. – Everything is interesting once you are interested in it.

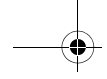


LISTENING TO THE LISTENING

POERKSEN: You think that anyone will become an enthusiast as long as the required talent for presentation is available.

MATURANA: Naturally. I remember vividly a teacher who came to one of my seminars one day. She found my ideas attractive, she told me, but she simply had to teach her children grammar – a laborious and dull kind of task. If she thought, I answered, that the teaching of grammar was inevitably laborious and boring and would not lead to a new understanding of one's language, then she would make her pupils feel precisely the same way. Of course, I could not tell her what she should do because she would have replied immediately: "That is what I have already tried many times – it just does not work!" However, I told her one thing very clearly: "If you have so little respect and love for your work, then your pupils are bound to hate grammar." She had to find the solution herself by changing her inner attitude; the pupils are always quick





to grasp whether their teacher is enthusiastically involved in his task.

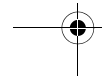
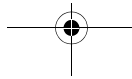
POERKSEN: But the problem surely is whether everyone will be interested in everything.

MATURANA: That is not the problem. Children are quite ready to become enthusiastically involved in anything provided of course that there are no people around who keep signalling and saying: "mathematics is tedious, grammar is dull, biology is uninteresting." People who have come to think in this way are handicapped. It is, of course, a permanent task to connect school topics with the everyday life of the pupils, and to foreground the questions that are of relevance to them.

POERKSEN: Are there not, however, certain amounts of subject matter that simply must be memorised because their deeper connection with the world of experience cannot be adequately dealt with owing to lack of time? The psychologist Ernst von Glasersfeld once suggested distinguishing between *training* and *teaching*; between drilling and learning by rote, on the one hand, and the active and creative construction of concepts and notions, on the other. Both are needed, he claims, and must be practised in the proper mixture as required by the given task.

MATURANA: A teacher must be flexible enough to choose the right procedure depending on the situation. Of course, certain things have to be memorised or practised repeatedly. Even simple repetition can, however, improve understanding because it sharpens one's vision and produces new insights. All of a sudden we find it easier to solve the equations before us; all at once our muscles change after we have dropped the ball into the net a few hundred times; our shots have become more precise. If you devalue the practice of repetition to an unavoidably boring routine activity, then you give it an additional significance that it does not deserve.

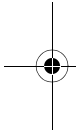
POERKSEN: Do you think that only good teachers make us really learn something? One morning there was a writing on the walls of the school I had attended: "We had bad teachers. It was a good school."



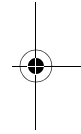


This seems to be quite correct to me because there is a dialectic of learning: You can definitely learn something by being exposed to negative examples, even including encounters with civil servants who are apparently immune to enthusiasm.

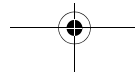
MATURANA: This is not the way I see it. The fact that some pupils obviously get along even under unacceptable circumstances does not suggest at all that the bad teachers are helping them in any way. Children who are confronted by disrespect and cruelty definitely need a space in which they can respect both themselves and others. A Peruvian psychologist has shown in a study that just one fully trusting adult is enough to help children regain their self-respect. Perhaps it will be the parents of the children who are maltreated by teachers, who believe in them, trust them and love them. Their support will help them to survive their terrible experiences and find their own way without despairing and breaking up. School cannot do too much harm in such cases. However, if there is no support from home and parents and no reinforcement of an autonomous way of life, then the schools have a special responsibility: Where if not there could a child develop self-confidence?

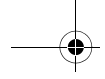


POERKSEN: You have recently established an institute in the centre of Santiago de Chile, which is mainly devoted to the further education of teachers. What recommendations do you offer the participants in your courses?



MATURANA: The distinction between two different kinds of listening seems to me to be of elementary importance for teaching. On the one hand, we can, if something is said to us, always check whether we agree with it, seek to establish the degree of correspondence with our own views – a central and wide-spread tendency in our culture. Those who listen in this way do not, however, really listen at all to anyone else except to themselves. The other kind of listening considers the question of the circumstances in which what is said is valid. In what area of reality is it correct? Do I like the world that is produced here? The advice I give the teachers coming to my courses is to show enormous patience, to listen to their pupils intensely, and to listen to their listening. If they respect others and grant them a space of legitimate presence, they will become loving beings in the flow of





interactions. What do children actually hear, we must ask, when we talk to them? What do they perceive? Are they scared of an act of aggression? Do they feel confronted by a threat? Or do they feel invited to cooperate?

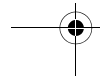
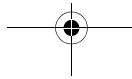
PERCEPTION AND ILLUSION

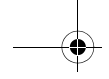
POERKSEN: In our present schools, mistakes appear to be of immense importance as indicators of failure and symbols of inadequacy. Schools, we might say, are training institutions for the avoidance of mistakes: they punish errors, mark wrong answers in red ink and reward faultless perfection with best marks. My question is now: What, in your view, are mistakes? How would you comment on this orientation of school practice?

MATURANA: We must see clearly that all human beings are intelligent and that they only very rarely commit logical mistakes. Children, in particular, make use of numerous distinctions, which do not please the adults and are, therefore, declared false and questionable. The opinion, for instance, that the ideas of a pupil are illogical and false means, as a rule, nothing but that what was said belongs to a domain of logic that is different from the logical domain which is the basis of the observer's listening and judging. In other words, a mistake is a statement made in a particular domain of reality, which is heard and evaluated in the context of another.

POERKSEN: It is commonly assumed that making a mistake means *not yet* knowing or seeing correctly.

MATURANA: Those who take the path of *objectivity without parentheses* consider mistakes and illusions as punishable errors, as symptoms of failure: There is something to be perceived and understood, and people simply cannot do it, cannot see things the way they really are. Those who, in contradistinction, follow the path of *objectivity in parentheses*, take the experience of an illusion and a mistake seriously. They want to know how illusions and mistakes arise. The answer is: Something is triggered in a structure-determined organism that corresponds to the proper features of the apparently perceived phenom-



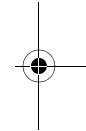
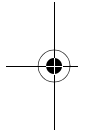


enon in a certain way and from a restricted perspective. This means that we can see illusions and mistakes – ironically – as partial truths; they partially correspond to a phenomenon, but we believe operationally that they are identical with the entire phenomenon.

POERKSEN: Could you give us an example?

MATURANA: Just think of the trout jumping to catch the artificial fly of the angler. It does so because the feathered hook is a perfect imitation of an insect hovering above the water surface. The realisation that there is no fly arises later, when the trout is dangling from the hook. The experience of an illusion is, as the example shows, accepted as valid when it actually occurs; it is devalued only because of other experiences and then classified as a perceptual error. In brief: Illusions and mistakes arise after the event, *a posteriori*.

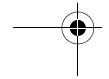
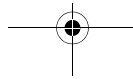
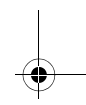
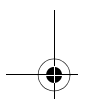
POERKSEN: Are there not perceptions that are patently illusory? What if I said to you: "Professor Maturana, look outside, there is a unicorn at the window observing us."



MATURANA: There are different possibilities of reacting to what you are telling me. I might suspect that you are making fun of me, or I might assume – unicorns are, to the best of our knowledge, mythological entities – that you are, at the moment, suffering from hallucinations. It is also possible that I might interpret your pointing out the unicorn there as an attempt to start a discussion about the indistinguishability of perception and illusion. All these interpretations have, however, one thing in common: they devalue the experience you have described to me.

POERKSEN: Could we just for a moment assume that I am really seeing a unicorn?

MATURANA: Of course we can. We should then discuss why I cannot participate in your experience – why I do not see the unicorn observing us. Is my perception limited in some way? Or is that unicorn possibly part of your internal world, which is inaccessible to me? However, I really want to point out something else: I claim that it is impossible, *in the moment of the experience*, to distinguish between



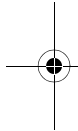


perception and illusion. If you are seriously reporting to me that there is a unicorn outside the window, then you are totally living in that world. Your whole body lives in that experience. You are absorbed by that world. Only later will it be possible to identify the unicorn as some strange movement of the leaves caused by a couple of birds. This means that an illusion is an experience that remains valid until it is disqualified by other experiences.

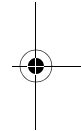
POERKSEN: So we actually never know whether what we see and describe is something real.

MATURANA: In the moment of the experience such a distinction is impossible in principle. We are always dependent on the reference to other experiences that can, in turn, only be classified as perceptions or illusions if they are related to other experiences. And so on.

POERKSEN: Does this mean that we might exist in a world of illusions throughout our lives without being able to ascertain this with any degree of certainty?



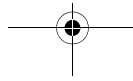
MATURANA: Immanuel Kant could formulate a thesis like that in connection with the *ding an sich* that we cannot know although it exists. You need the ultimate reference in order to be able to say that everything is an illusion. I would not argue in this way.



POERKSEN: What I actually wanted to ask is whether we can, in a deep sense, ever make sure that what we assume is not illusory?

MATURANA: We can never know whether our perception today will not appear as an illusion tomorrow. It may, of course, remain valid throughout our whole life. It is possible, after all, that I might confess to you tomorrow that everything I said yesterday was false. How can you know that, by the end of the week, your trip to Chile will not appear to you to have been a mistake? And that, when you are listening to the recorded tapes again, you will not come to the conclusion that Humberto Maturana talks complete nonsense?

POERKSEN: I certainly do not expect that because I have prepared myself intensively for our time together. I read your books, bought

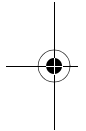




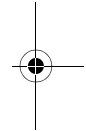
my ticket, booked a hotel. The sudden loss of all this stability and the collapse of my previous beliefs would probably upset me very much, and for that simple reason alone I would not be prepared to consider my trip to Chile a mistake.

MATURANA: Nevertheless, we simply do not know whether you will not one day end up with such an assessment. The crucial aspect is, however, that we always hold the experiences that we are making to be valid. In this sense you are, of course, right: We need this stability in the flow of our lives, we operate out of implicit trust, and we usually do not commit mistakes because we live along within the coherences of our structural coupling. Therefore, mistakes are infrequent and do not indicate some failure with reference to an observer-independent reality; they are *a posteriori* evaluations and reflections of a human being living in language.

ALL HUMAN BEINGS ARE EQUALLY INTELLIGENT

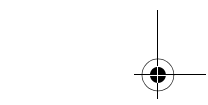
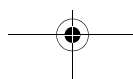
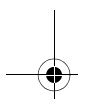


POERKSEN: For most of your academic life you have been engaged in research and not so much in teaching. Let me ask you nevertheless: What has working with students meant to you? From time to time, there is some debate in the universities about whether the combination of research and teaching should be abolished: The students, it is said, simply cannot cope, and the top researchers, at least, should be exempted from teaching.



MATURANA: I do not consider that desirable at all. Teaching has always been extremely important to me because, when inspired by intelligent remarks from students, I could use my seminars as laboratories for testing possibilities of thinking. I have never been bored, because any question that comes up may be interesting and may lead to further reflections when you look at it more closely. I could never accept a devaluation of the students because I fundamentally believe that all human beings are equally intelligent, anyway.

POERKSEN: Is this correct? Surely, some are a little more equal than equal – and therefore a little cleverer than others.





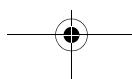
MATURANA: No. Intelligence manifests itself in the possibility of varying one's behaviour in a changing world. Whenever we classify a living being as intelligent we want to assert that it is capable of adequately transforming its life. As beings living in language we need and possess such a gigantic plasticity of behaviour that we can say with full justification: This one fact that we exist in a domain of the coordination of coordinations of behaviour renders all of us living beings of equal intelligence. Naturally, there are different experiences and predilections, interests and capabilities, – that is certainly the case. I claim, however, that any human being can learn what any other human being has learned, if he or she only wants to.

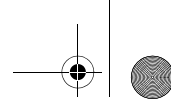
POERKSEN: Now you sound as if any individual could become an Albert Einstein – an icon of superior intelligence.

MATURANA: Not everyone can become an Albert Einstein but everyone can, if they want to, learn what Albert Einstein learnt and taught. Naturally, they will not go the same way as Albert Einstein, and they will not invent the same concepts and theories because this would require the same circumstances of living plus identical experiences. In addition, any person who has chosen a form of life and a professional career inevitably constrains his other capabilities. If I want to become a star in bodybuilding, I have to concentrate on particular demands – and others will not even surface. This does not mean, however, that the bodybuilder lacks fundamental intelligence simply because of his or her decision for a certain kind of existence.

POERKSEN: How do you explain, then, that all these equally intelligent human beings are not at all equally successful? Most of the intelligence tests on the market are based on the assumption that the differential success in solving the problems presented is an indicator of intelligence.

MATURANA: What intelligence tests elicit and diagnose is the degree of inclusion in a culture. It is, as I claim, the emotions that determine whether and to what extent we are able to exploit our capabilities and our fundamental intelligence. The dominant emotion modulates intelligent behaviour in a decisive manner. Some individuals may be unable to follow because they are scared, and they will behave dif-





ferently from individuals who are depressed or who are just bored because their interests lie somewhere else. Finally, an enormous breadth of variation in predilections and capabilities arises from the particular situation in which people grow up. Were they loved when they were young? Were they properly looked after? Was there enough food? Anyway, I insist: Intelligence is, for me, not some specific activity but the general capacity to move in a changing world flexibly and with internal plasticity.

POERKSEN: Still, there is the undisputed experience that people try and work extremely hard to understand things and nevertheless just do not ever manage.

MATURANA: If people make every effort and work hard this might indicate that they are actually bored. Why should we occupy ourselves with certain topics? Only to be able to demonstrate that we are intelligent? What other purposes might the knowledge serve that we have to acquire for the intelligence tests? Perhaps the people worried by questions of this sort would do well to move into other domains that are of real interest to them and in which they are active with pleasure and concentrated attention. But perhaps they are blocked by fear; perhaps children are afraid of the teachers' punishment and tormented by the fear of failure as soon as they arrive at their school. In such cases love, respect and trust will help.

