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Sensory Dimensions in Intercultural Perspective and the Problem of Modern Media and Technology

The World Character of the Senses

Sensuality is the standing open of a world. The more that humanity develops this area of the open, the richer the possibilities of world reference become. The necessary condition of sensuality is humanity's embodiment. The body is the point of junction of all individually sensual experience. Bodily being is the zero point, from whence both "fundamental sources" of knowledge—sensuality and understanding—unfold. A primacy inheres in sensuality vis-à-vis understanding and thought, because it is out of sensual referentiality that the orders of a world crystallize for the individual human. The infant is not firstly pure mind that then, thinking, turns itself to the sensible world. The infant is rather born into sensual and bodily interwovenness in worldly contexts, which, by thought and judgment and the accompanying conviction of a constant "I" that accompanies all of his or her ideas, is cut away more and more and can be lost as an original formative power. Thought—as a mental attachment of ideas—develops (itself) out of experiences, which are accessible to humans only in their sensuality.

The five senses—touch, taste, smell, hearing, and sight—which we have come to take for granted, emerged through a long evolutionary process. We find the combination of five senses first in the animal kingdom. The comparison of the sensory abilities of animals to those of humans shows that animals often develop one sense to such a degree that we refer to it as a supersense—for example, the auditory sense of whales, the sight of birds of prey, the canine olfactory sense, etc.).¹

The comparison with animals demonstrates that sensuality has acquired a quite specific dimensioning, which itself is the expression of a historical development. The specific sensuality of plants, of animals, and of humans thus makes possible infinitely many world spaces emerging out of the con-

stellation and quality of the senses. After a longer comparison of animals' abilities to those of humans, Montaigne remarks as follows: "Such achievements as we observe in other living things, and which are greater than ours, prove though that they have an ability superior to ours in this regard, which ability remains hidden from us—as probably many other faculties and powers, which do not even penetrate to our perception."² As the reference to the animal kingdom already implies, the biological unfolding of human senses is not yet necessarily completed, but rather it may also come to pass that new senses should disclose or also close themselves again for humans. How the history of the senses unfolds further is decided also to a great extent by cultural organization, which humans develop on the basis of their sensory openness.

If humans use their spaces of sensual experience differently, then one can assume that, for them, different orders of reality and world result. Here an origin of the variety of human cultures can be made out. It has become commonplace that the sense of sight plays an outstanding role for the philosophical interpretation of reality in European culture. Heraclitus says: "Eyes are more exact witnesses than ears" (Β ΤΟΤΑ). And since Plato brought "actual reality" into connection with "ideas" (the seen), many philosophical approaches oriented themselves again and again toward "seeing," without demonstrating convincingly why this sense should enjoy special privilege. Kant argues: "The sense of sight is . . . however, the most precious; because it . . . feels its organ the least affected (because it would not otherwise be mere seeing), herewith then it comes nearer to a pure vision (to the pure idea of the given object without perceptible sensibility added in)."³ Even Kant proves in this citation to be a Platonist, interested here in a "pure vision," which removes itself as far as possible from concrete perception and thus provides the greatest possible distance to the sensible world. Many philosophical concepts in the European tradition have been fastened to the paradigm of sight and not, for example, to the paradigm of hearing⁴ or the paradigm of scent.⁵

Should sensual orientations play a role in the development of cultures, a large area of research is opened for exploring emphasis structures in separate cultural traditions. In this area of research, it could be found that individual cultures have especially developed certain areas of sense culturally, philosophically, or artistically, whereby certain evidence of reality is at the same time generated and relayed that renders important that which plays a minor role in other cultures.

Sensory Dimensions and Cultural Orders

Ancient Chinese culture offers one possible example of a culture that displayed already in its beginnings a special affinity to the auditory sense. In the philosophical interpretation of reality, the ancient Chinese often used

musical patterns of interpretation. For example, in *Yueji*, the Classic of Music (a book from the *Liji*): “[The note] *gong* represents the ruler; *shang*, the ministers; *jue*, the people; *zhi*, affairs; and *yu*, things. If there be no disorder or irregularity in these five notes, there will be no want of harmony in the state. If *gong* be irregular, [the air] is wild and broken; the ruler of the state is haughty. If *shang* be irregular, [the air] is jerky; the offices of the state are decayed. If *jue* be irregular, [the air] expresses anxiety; the people are dissatisfied. If *zhi* be irregular, [the air] expresses sorrow; affairs are strained. If *yu* be irregular, [the air] is expressive of impending ruin; the resources [of the state] are exhausted. If the five notes are all irregular, and injuriously interfere with one another, they indicate a state of insolent disorder; and the state where this is the case will at no distant day meet with extinction and ruin.”⁶

Accordingly, music was also an essential instrument in human education in ancient China. This is immediately reminiscent of Plato, in whose thought music also played an important role in human education: “Is then, my Glaukon, education by way of music not therefore of decisive import, because rhythm and harmony penetrate most of all inside the soul and grasps it most strongly, bringing with it the correct attitude and forming man accordingly.”⁷

One ought attend, however, to the essential difference in the meaning of music within these philosophical contexts. Musical education in Plato merely prepares one for the actual vision of the ideas. The form of the final and deepest philosophical knowledge is sight and not hearing. In ancient China, on the other hand, there are no “ideas” that must be seen beyond the musical interaction. The interactive happening itself, as the unified vibration of the different participating moments, is not to be seen but to be realized, which is described more in the mode of hearing than of seeing.

One word, which is called upon repeatedly to describe a successful interaction is the Chinese word “*ying*,” which has several levels of meaning. In the first tone, it means (1) ought, should, must, necessary; (2) suitable, fitting, proper; and (3) to fulfill, to be fulfilled. In the third tone, it means (1) to reply, to respond, to echo; (2) to correspond to; and (3) to echo, to rely.

Three moments are contained in the spectrum of the meaning of “*ying*”: (1) an answering approach to a thing; (2) an affirmation toward a thing; and (3) a resounding resolution in a thing.

Another word that fits into this context is *zhi* (to know) *yin* (timbre, sound). It can be translated as “to be musical, to know, to be acquainted with; to appreciate motives.” That is, if I know the sound of some person or something, I am acquainted with that person or thing.

Last but not least, an architectonic example may be included in which the acoustic dimension essentially determines the significant content. In the Temple of Heaven in Beijing, we find the “Mound Altar” and the “Imperial Vault of Heaven.” In the middle, when one stands upon the resonance stone of the uppermost level of the Mound Altar, each generated sound per-

meates the entire space of the uppermost level, such that one gains the impression of taking in the entire room through an acoustically extended body. Upon this altar the emperor sets space and time anew, year after year, for the entire kingdom. In the “Imperial Vault of Heaven,” the wall of resonance that surrounds the entire square is especially impressive. Each word whispered on one end of the wall is to be heard on the other end. Every smallest sound is this audible through the whole empire.

I do not wish to assert here that sight played no role in ancient China, but rather to emphasize that in each culture all senses—and perhaps yet other than the senses normally accepted by us—play a certain role but receive a different emphasis in the interpretation of reality. With this emphasis, the fundamental modes of the opening of reality that correspond to each sense fall into the foreground or into the background. If it is true that the philosophical orientation toward sight tends to generate a more object-oriented ontology, the orientation toward hearing tends to motivate a life from out of occurrence,⁸ and the central position of scent and taste tends to move the atmospheric into the foreground. The tradition of sensuality in which a philosopher stands, though it does not bind him or her absolutely to a certain interpretation of reality, biases him or her toward it via the sensual horizon repeatedly.

Biases toward certain sensory experiences are often supported by language. In languages, word fields are developed for certain fields of phenomena. Again, these do not determine humans absolutely in their perception but encourage them in certain sensory modes that can be correspondingly verbalized, and this becomes relevant for philosophical interpretation.

In Chinese and Japanese, for example, the field of the Sino-Japanese word “*ki*” is emphasized,⁹ which can be translated as “vapor, spirit, finest influence, breath of life, gaseous expansion, ethereal matter, fluid, breath, or power of life.” It is used in Japanese, for example, in the following ways: *ki ga aru* (to have *ki*: if a man, for example, should be interested in an activity or a woman), *ki ga kiku* (*ki* works: when one attentively and thoroughly senses what the situation requires), *ki ga shizumu* (*ki* sinks: when one becomes melancholy and depressive), *ki ga haru* (*ki* stretches: when one feels uptight and tense). “*Ki*” does not simply describe a subjective impression that an individual has with regard to an object, but rather the expressions connected to *ki* describe an atmospheric constitution of a situation in which the individual is one moment. The phenomenon of *ki* is perhaps better disclosed within a situation of smell, where one finds oneself in an invisible field of aroma, and this aroma mostly puts one immediately into a specific mood. *Ki* is invisible and inaudible, but present, like a scent that envelops one completely and swallows one. Because *ki* is not, however, disclosed to any of the five senses completely, the question urges itself upon us of whether we are dealing here with an entirely separate sense.

“*Ki*” (Chinese: “*qi*”) has been treated in multiple ways in China as well as in Japan as a fundamental philosophical term. It plays a chief role still

today even in the most common expressions of everyday language. Its field of meaning is so broad that it would be possible "to formulate a phenomenology of human relations, or of mutual perception or experience, oriented solely on the stimulant-, reaction-, and response forms of *ki* or, so to speak, the interactive *ki*."¹⁰ The level to which the attention is directed in the "*ki*" wordspectrum refers especially to moods and atmospheres that resist a simple objectification. An area is being spoken of that lends all activities, and thereby also thought, a certain hue, mood, scent, flavor, or quality of feeling. This word spectrum offers thus an outstanding starting point for an inquiry into sensory structures in East Asian cultures.

One further example shall be given here from Indian culture. In the Yogacara School of Buddhism, there developed a theory of experiential knowledge that uses scent as the principle basis of interpretation. One central concept in this theory of knowledge is *vasana*: "It is in Sanskrit an appellation for the impressions of experience in the mind and comes from: -b vas, to make to smell good. As the aroma of a sesame blossom is contained in its seed or as a perfume remains in clothing which has been perfumed, so experiences also leave their traces in the mind. These traces or impressions are preserved in the subconscious and are supposed to have the ability to reappear when the time and certain circumstances ripen."¹¹ That means that every experience and discovery that we have is like a scent or aroma that sediments itself in our entire body—as a certain scent in a piece of clothing.¹² We are "perfumed" by every experience that we have, so that each human has an individual aromatic structure (= experiential structure). This thought can be compared with Merleau-Ponty's idea of "habitualization,"¹³ which perhaps can still be more concretely unfolded with the Indian image.

In the foreword to *Varieties of Sensory Experience: A Sourcebook in the Anthropology of the Senses*, David Howe writes: "Western societies are overwhelmingly dependent on visual and verbal faculties for their experience of the world. But different societies use and combine the senses in different ways and to different ends. What is the world like to a culture that takes actuality in less visual, more gustatory or tactile, auditory or olfactory terms than those to which we are accustomed? What is the impact of other 'sensory ratios' on the life of the mind and the emotions? What is the relation of the hierarchy of the senses to social hierarchy, or relation between the sexes?"¹⁴

It is interesting to note that many ethnological studies have hitherto given little thought to the sensory orientation of the society that they research, and therefore such studies are still unconsciously determined by the visually centered European culture: "Far more cross-cultural research has been undertaken on the topics of visual illusion and colour classification than on the perception of timbre or tactile qualities—not to mention the perception of olfactory or gustatory qualities."¹⁵ In Howe's book, examples are given from various cultures that demonstrate how individual senses culturally can

take on a comprehensive meaning. Howe mentions, for example: "The Kalui use drumming to convey messages and mobilize emotions in a range of ways that the Western ear is but poorly tuned to pick up,"¹⁶ "how the tactile involvement of the Siddha physician contrasts with the visual detachment of the Western physician,"¹⁷ how the sense of taste is employed among the Weyewa of Sumba, Indonesia, during a social visit as a carrier of meaning and as a communicative means, and what might underlie "the apparently universal practice of using odoriferous substances in the context of puberty, death, and other rites of passage."¹⁸ This new sensibility for the differentiation of the senses and their meaning for the formation and construction of each of the cultural orders brings a considerable expansion of anthropology's previous methods.

In the inspection of the order of the senses in different cultures, one is surprised by the fact that the classification of the sensuality of the human experiential world does not enjoy universal agreement, as we are accustomed to in our topos of the "five senses." E. Scheerer writes:

As the expression 'five senses' is to be found in many modern languages, it suggests the existence of an ahistorical semantic universal which has as its content the concept 'sensory organ' as well as the fivefold thereof. In reality the concept of a numerable, firmly established number of senses as bodily organs with a mental function (feeling or perception) bound to it is a product of early philosophical reflection which is yielded only through the combination of multiple presuppositions of thought. Such presuppositions are: The structuring of a mental 'inner world' out of the individual originally conceived as a psycho-physical unity; the distinction between 'knowledge' and 'action'; the distinction within the cognitive functions between sensory and intellectual knowledge, and the production of a functional relation between the two.¹⁹

This statement can be confirmed with a glance at classical Indian philosophy. In the Brhadaranyaka Upanishad a list of eight senses is given: (1) *prana* (breathing organ, i.e., nose; also "breath of life"); (2) the speech organ; (3) tongue (taste); (4) eye (color); (5) ear (sounds); (6) *mana* (thought, mind, inner organ); (7) hands (work); and (8) skin (sense of touch). It is conspicuous that the olfactory organ is named first, as it is in close relation to the breath of life and thus has a fundamental function. In crass contrast to this, Kant, for example, says: "Which organ sense is the least rewarding and seems also to be the most dispensable? That of scent. It is not rewarding to cultivate it or even to refine it for enjoyment; for there are more objects of revulsion . . . , than of comfort which it can provide, and the enjoyment by way of this sense can also always only be fleeting and transient if it should be enjoyed."²⁰ In the list of eight senses, one further important point is conspicuous: "thought" (*mana*) is also numbered among the senses, which has considerable consequences for philosophical argumentation strategies.

In addition to the different classifications of the senses, one can assume

that the senses each have their own history in the several cultures such that individual senses can gain or lose importance with regard to the interpretation and formation of reality in the course of time. The following references shall suffice here to demonstrate the possibility of a connection between the philosophical project of an "anthropology of the senses"—as is already to be found in Aristotle's *Peri Psyche* and in the twentieth century was taken up by Helmuth Plessner,²¹ Erwin Straus,²² Maurice Merleau-Ponty,²³ and many others—and the ethnological project of an "anthropology of the senses" based upon the sensual orders in the cultures of the world. Among Western philosophers the question remains focused on the abstract significant content of the senses, whereas cultural anthropologists are interested in the concrete sensory structures in different cultures.²⁴ The binding of these two projects could be fruitful, with regard to Western philosophy, in that it could call attention to blind spots in its sensory orientation.

Sensory Dimensions in the Horizon of Modern Media and Technology

From this point, I would like to ask further about the presence of the senses and their future development in the cultures of the world in connection with the medial possibilities that are at our disposal today. Already in the 1960s, Marshall McLuhan analyzed the context of medial development and the sensory orders in different cultures. He writes:

Any culture is an order of sensory preferences, and in the tribal world, the senses of touch, taste, hearing and smell were developed, for very practical reasons, to a much higher level than the strictly visual. Into this world, the phonetic alphabet fell like a bombshell, installing sight at the head of the hierarchy of senses. Literacy propelled man from the tribe, gave him an eye for an ear and replaced his integral, in-depth communal interplay with visual linear values and fragmented consciousness. As an intensification and amplification of the visual function, the phonetic alphabet diminished the role of the senses of hearing and touch and taste and smell, permeating the discontinuous culture of tribal man and translating its organic harmony and complex synaesthesia into the uniform, connected and visual mode that we shall consider the norm of 'rational' existence.²⁵

This early reevaluation of the sense of sight, first through the invention of writing and then through the invention of printed text, continues through the technological development of the last century. At the beginning of the twentieth century, technological discoveries began to spread themselves over the world that will have an unforeseen effect on the emphasis of the senses. With the invention of the telephone, the radio, the phonograph, and the tel-

evision on the one hand, rapid expansions with regard to the senses of hearing and sight resulted. With the development of the computer and the Internet, this development is further accelerated, so that children's play habits have now changed and a visual and aural centralizing occurs that probably pushes the other senses ever more into the background. The so-called distance senses have, through their ability to be electrified and digitalized, reached a degree of perceptive primacy in mediated communication so that all other senses play only a subservient role. All attempts to electrify and to digitalize the sense of smell, taste, and touch in order to make these senses communicable even over greater distances do not appear able to boast of any noteworthy success.

Additionally, especially in the big cities, the aromatic landscape has been reduced to a very few scents. Industrially prepared nourishment and utility goods stunt both the sense of taste and the sense of touch. It appears as though the "higher senses," as they used to be called, have already defeated the "lower senses." Without wanting to fall here into general social criticism, the question arises for me about the future of the senses in view of modern media and technology. When the computer, with all its possibilities shall spread out over the world, changing perceptive customs even unto the very last culture, what will become of the various sensory emphasis structures in different cultures? Will the "lower senses" be able to assert themselves, or will they degenerate? Should they degenerate and determine to an ever lesser degree human world order, how will the image of humans and their way of life change? The structure of human senses has been severely affected by technological development in the twentieth century. If sensory structure changes in historically and culturally specific ways, then it is to be expected that we are on our way to a fundamentally new ordering of the senses; this will only really come to bear when human corporality reacts, perhaps even organically, to this drastic change, as once the erect gait of humans brought about a completely new emphasis among the senses. The twenty-first century will show to what extent human senses shall be further "medializable," and what effects this should have on human existential structures.

Aside from the audiovisual media, which are not grown directly together with our body, one further relevant change of our way of life will bring with it the possibility of allowing our body to grow together directly with machines or computers. Pacemakers have already saved humans' lives for a long time. Today, however, it is possible to connect the brain of a human directly to a computer with the help of an implanted chip.

Researchers at Emory University in Atlanta have implanted glass-coated electrodes in the brain of an almost completely paralyzed patient. Because the glass was coated with a substance conducive to nerve growth, brain neurons grew into the hollow glass pins in the course of a few weeks and there made contact with the electrode wires fashioned out of gold. Contact

to the outer world is provided through inductor reels (*induktionsspulen*). Via aimed influence of brain activity, the patient can again for the first time, even if with difficulty, make himself understood.²⁶

Aside from these possibilities, scientists are also attempting via machines and prostheses to improve the function of the sensory organs or even to make them replaceable. Artificially—that is, technically—enhanced eyes, ears, and noses could soon open to us sensory worlds that have hitherto remained closed: “Should the laboratory dreams of scientists come true, we shall be able in years to come to see with damaged eyes, to hear with aged ears, to smell an entirely new repertoire of aromas and to taste a sweeter world.”²⁷ Because of these developments, we need no longer even wait for our bodies to show organic reactions to changes in the sensory stimuli and functions. What effects these technological alternatives will have for people is today not yet predictable. It is certain, though, that our lived world has already changed drastically through new media and technology. Humans are intent on designing themselves anew. Here, however, the old question concerning the good life becomes once again crucial. How can a good life be formed today in the horizon of the new possibilities? Which starting points for an ethical education of human beings can there still be that are neither founded merely upon a single cultural horizon of values nor aimed at generating a canon of duty through one formal criterion?

**Loss of the Senses:
Technological Expansion of
the Senses and the Question of
an Aesthetical-Ethical Education of Humans**

As Plato and the ancient Chinese already knew, the development and aesthetic education of human senses are not merely of secondary import but belong rather also centrally to the ethical education of humans. An important question connected with aesthetic education is the extent to which today’s tendency to make the senses one-sided, and perhaps even to brutalize these, contributes to the waxing bellicosity in many industrial societies of the world. Here, as well, reference can be made to ancient traditions that see the ethical attached to the aesthetic most closely. The anthropology of the senses is connected in this way to the fundamental questions of ethics in the intercultural perspective. Could we perhaps bring ethical phenomena into view on the foundation of an anthropology of the senses in an intercultural perspective and make them fruitful for human education in a new way?

The phenomenon of *qi* (Japanese: *ki*) already mentioned above has been a central foundation for ethical education in China from time immemorial. People who can realize the different qualities of *qi* at all levels of human and natural relations obtain thereby the ability to act in concrete situations so

that all those concerned are furthered in their vivacity and mobility. In China and Japan, concrete forms of cultivation for the development of this special art of sensibility have been developed. From the perspective of sensuality, this ability could be described as a “synesthetic” realization of entire situations in the sense of a living “symphony of the senses.” This aesthetic interpretation of *qi* also corresponds to the principle of Chinese calligraphy and painting: *qi yun sheng dong*. The attempt is made in calligraphy and painting to realize and not merely “to portray” this very living movement of *qi*. In this way, every movement of life can be made like a painting of calligraphy so that the act of painting and the act of everyday life are not fundamentally different from one another. This form of aesthetic education of people, whose natural effect is a successful and good life, has been developed in East Asia in manifold ways. Chinese painting, calligraphy, poetry, and tai chi, and Japanese tea ceremony, flower arrangement, archery, and so on, each hands on this experience in its own way.

After the fall of the Greek world, the concept of the aesthetic education of people first achieved general interest again in Europe in the eighteenth century via Friedrich Schiller. Of the many different approaches that were developed thereafter, I would like to elaborate on only that of Maria Montessori.

For Maria Montessori, the discovery of a certain sense-founded quality of occurrence became the starting point of pedagogy. She made the discovery of the “Montessori phenomenon” with a “three year old girl who was deeply engrossed in her activity with a peg board out of which she pulled the small wooden pegs, which she then returned to their places.” Montessori continues, “The expression of the girl bore witness to such intense attentiveness that it was for me an extraordinary revelation.”²⁸ In the course of the game, Montessori attempted to disrupt the child by putting her and her stool onto a table and having the other children in the room sing a song. Montessori remembers: “They sang, but the girl continued repeating her activity unwaveringly, even after the short song had ended. I had counted 44 repetitions; and when she finally stopped, she did so independently of the stimuli of her environment which could have disturbed her; and the girl looked with satisfaction about her, as though she had awakened from a refreshing sleep. My unforgettable impression was like unto that which I believe one feels in a discovery.”²⁹ The discovery of this phenomenon led Maria Montessori to new insights regarding the “self-upbringing” and “self-education” of the human personality through interacting with things found in the environment:

Every time such a polarisation of attentiveness occurred the child began to change completely. It became calmer, almost more intelligent and more communicative. It revealed extraordinary inner qualities reminiscent of the highest phenomena of consciousness like that of religious conversion. It appeared as though a point of crystallisation had formed

in a saturated solution around which then the entire chaotic and untamed mass united to the formation of a wonderful crystal. After the phenomenon of polarisation of attentiveness had taken place, everything disorganised and inconstant in the consciousness of the child seemed in a like manner to organise itself to an inner creation whose surprising features repeated themselves in each child. . . .

This is reminiscent of the life of a man which can lose itself among things in a low chaotic state until one special thing attracts and fixes it—then the man experiences the revelation of himself, and he feels that he begins to live.³⁰

Through the discovery of such a quality of occurrence, a redetermination of the relation of sensuality and intellect is possible, because the intellect forms first through sensory stimuli in immediate activity (a child plays with wooden blocks, an artist works on a stone), and because things, led by the intellect, are changed in bodily doing. The unity of occurrence of intellect and sensuality, which shows itself here, is the precondition for a self-consummating “formation” of a person in an occurrence that can be described as “engrossing doing.” In Montessori, the quality of occurrence stands out quite distinctly and is also understood as the central phenomenon of her pedagogy. In positions that have as their starting point this quality of occurrence, a strict unity in the self-activity of the occurrence is always yielded.

Although this way of occurrence has recently been involved again in philosophy or other liberal arts in the West as well, it has nevertheless been a central starting point for the sensory education of the human, especially in East Asia since time immemorial. At this point one should think especially of philosophical Daoism (Laozi, Zhuangzi) and its idea of nonaction (Chinese: *wu-wei*) and of Chan Buddhism (Japanese: *Zen*). In the Western tradition, as well, still other examples can be given in which a similar quality of occurrence becomes the starting point of reflection.³¹

The positions in Asia, as well as the aforementioned positions in Europe, see a close connection between a person's ability for aesthetic perception and a person's ethical competence. It is, then, an urgent task, in light of the waxing bellicosity in many modern societies, to bind together these approaches in Asia and Europe in order to gain new impulses for the development of the senses with regard to the ethical education of the human in an intercultural perspective. The new technological alternatives, spoken about above, need not necessarily have negative effects. But in order to counteract the sensual brutalization of humans through these technological possibilities, such new alternatives should be integrated positively into our lived world (*Lebenswelt*), especially on the foundation of an aesthetic education of the human that supports itself with the manners of sensory experience of different cultures. Technology can thus enrich our sensual life, supporting it where it seems appropriate.

Notes

1. Brian J. Ford, *Sensitive Souls: Senses and Communication in Plants, Animals, and Microbes* (London: Little, Brown, 1999).
2. Michel de Montaigne, *Essais*, bk. 2, no. 12 (*Apology for Raymond Sebond*), trans. H. Stilet (Frankfurt am Main: Eichorn Verlag, 1995), 225.
3. Immanuel Kant, *Anthropologie in Pragmatischer Hinsicht*, BA 50.
4. See W. Welsch, “Auf dem Weg zu einer Kultur des Hörens?” in *Grenzgänge der Ästhetik* (Stuttgart: Reclam, 1996).
5. M. Onfray, *L'art de jouir: pour un matérialisme hédoniste* (Paris: Editions Grasset and Fasquelle, 1991).
6. James Legge, trans., *The Sacred Books of China: The Texts of Confucianism, The Li Ki* (1885; reprint, London: Oxford University Press, 1992), 94.
7. Platon, *Politeia* 401d.
8. Bernhard Waldenfels, *Sinnesschwellen: Studien zur Phänomenologie des Fremden 3* (Frankfurt am Main: Suhrkamp, 1999), 194 f.
9. Jeff Garrison and Kayoko Kimiya, *Communicating with Ki: The “Spirit” in Japanese Idioms* (Tokyo: Kodansha International, 1994).
10. Peter Pörtner, “Notizen zum Begriff des Ki,” in *Referate des 6: Deutschen Japanologentages in Köln, 12–14 April 1984* (Hamburg: v. G. S. Dombrady and F. Ehmcke, 1985), 226.
11. J. Masuda, *Der individualistische Idealismus der Yogacara-Schule* (Heidelberg: Harrassowitz 1926), 30.
12. The Chinese word for “*vasana*” is “*xunxi*”; the Japanese is “*kunju*.”
13. Maurice Merleau-Ponty, *Phénoménologie de la Perception* (Paris: 1945).
14. David Howes, ed., *The Varieties of Sensory Experience: A Sourcebook in the Anthropology of the Senses* (Toronto: University of Toronto Press, 1991).
15. *Ibid.*, 14 f.
16. *Ibid.*, 15.
17. *Ibid.*
18. *Ibid.*, 16.
19. E. Scheerer, “Die Sinne,” in *Historische Wörterbuch der Philosophie* (Basel, Switzerland: J. Ritter, 1971), 82 ff.
20. Kant, *Anthropologie in Pragmatischer Hinsicht*, BA 55.
21. Helmuth Plessner, “Grundlinien einer Ästhesiologie des Geistes” (1923) and “Anthropologie der Sinne” (1970), in Helmuth Plessner, *Gesammelte Schriften 3: Anthropologie der Sinne* (Frankfurt am Main: Suhrkamp, 1980).
22. Erwin Straus, *Vom Sinn der Sinne: Ein Beitrag zur Grundlegung der Psychologie, zweite, vermehrte Auflage* (Berlin: Springer Verlag, 1956).
23. Merleau-Ponty, *Phénoménologie de la Perception*.
24. The following are some important books on the senses, all edited by Uta Brandes and published by von Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, Göttingen, Germany. Sight: *Sehsucht: Über die Veränderung der visuellen Wahrnehmung*, 1995). Hearing: *Welt auf tönernen Füßen: Die Töne und das Hören* (1994). Smell: *Das Riechen: Von Nasen, Düften, und Gestank* (1995). Touch: *Tasten* (1996) and *Geschmack: Geschmack-sache* (1996). On the senses in general: *Der Sinn der Sinne* (1998). See also Dieter Kamper (Hg.), *Das Schwinden der Sinne* (Frankfurt am Main: Suhrkamp, 1984).

25. Marshall McLuhan, as quoted in David Howes, "Sensorial Anthropology," in *Varieties of Sensory Experience*, ed. Howes, 172.

26. Peter Thomas, "Die neuen Maschinenmenschen," *Spektrum der Wissenschaften*, Special Suppl. (April 1999): 45.

27. Kathryn S. Brown, "Ersatzsensorik für Blinde und Taube," *Spektrum der Wissenschaften*, Special Suppl. (April 1999): 40. See also Kathryn S. Brown, "Your Bionic Future, Part 2: Your New Senses," *Scientific American*, Special Suppl. (fall 1999).

28. As quoted in Helmut Heiland, *Maria Montessori* (Hamburg: RoRoRo Bildmonographie, 1991), 44.

29. Ibid.

30. Ibid., 46.

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7 Technology, Communication, and Education

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ON THE EDGE OF THE
THIRD MILLENNIUM

Edited by
Peter D. Hershock,
Marietta Stepaniants,
and
Roger T. Ames

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