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History of Telepresence: Automata, Illusion, and Rejecting the Body

Oliver Grau

Telepresence unites three themes with deep roots in intellectual history: automation and the search for artificial life, illusion in art, and the rejection of the body in favor of a spiritual or mentalistic conception of the human self. In order to understand telerobotics—its historical, psychological, and epistemological importance—we must understand how these three themes have been expressed throughout history in our technological myths and fantasies. That is what I propose to do here. I will examine the historical precursors to telerobotic technology, focusing on technological manifestations of our notions about artificial life, the aesthetic traditions of *virtual realities,* and the occult precursors of *telecommunications.* The history of technology has always included a history of its utopias and myths that reveal human desires, and serve to express proto-rational points of reference. Myths do not lose their relevance by virtue of being ancient. They are about how we view the world, and as such may be outside of ordinary time. They drive history.

A. Automata

The conception of human beings as machines reaches back to antiquity. As early as the second century, the famous physician Galen conceived his pneumatic model of the human body in terms of the hydraulic technology of his age. Art was already being automated in the mechanical theater of Heron of Alexandria. Using a system of cords, pulleys and levers bound to counterweights, as well as sound effects and changing scenery, Heron was able to create an illusion that brought the legend of Naplius to life. In the seventh century, Shui Shi Tu Jing published the *Book of Hydraulic Elegancies.* Indeed, one continually finds descriptions of such technological wonders as mechanical flying doves, dancing apes, and talking parrots in the literatures of Islamic nations, India, China, and Greece. In fourteenth-century Florence, it was none other than Filippo Brunelleschi who designed a mechanical stage to bring Paradise to *life.*

Medieval evidence of the automaton is almost completely non-existent,[1] since a mechanistic world-view was inconsistent with religious dogmas that

1. Horst Bredekamp discovered monastic automata from the sixteenth century that mechanically prayed the rosary. H. Bredekamp, *Antikensehnsucht und Maschinenglauben: Die Geschichte der Kunstkammer und die Zukunft der Kunstgeschichte* (Berlin: Wagenbach, 1993), 72 (figure 31). Legends of automation from the middle ages can be found in Reinhold Hammerstein, *Macht und Klang* (Bern, 1986).

proclaimed man, God's creation, the *alter deus,* the vessel of the eternal soul. By the seventeenth century, however, we find a return to mechanistic thinking with analogies between the body and the period's most elaborate technology, the clock.[2] In 1615, Salomon de Caus published his famous collection of plans for automata and gardens, *Les Raisons des Forces Mouvantes,* which was intensely studied by Descartes in his effort to construct an android that would in no ascertainable way differ from a human being.[3] Descartes interpreted biological processes as mechanical occurrences. His English contemporary, Thomas Hobbes, took the mechanistic *Weltanschauung* an important step further by understanding all organic phenomena—including mental phenomena—as physical bodies in motion.[4] Whereas Descartes believed in a nonphysical mind distinct from the body, Hobbes took mental phenomena to be nothing more than the movement of bodily substances in the head. The interaction between technology and artificial life is illustrated particularly well by a political event of the seventeenth century: During an interregnum, the dead English king was represented by movable puppets at his own funeral. This led to the further development of movable figures that, in case of a power vacuum, were used to artificially manifest the absent rulers. In this context we find the machine not as a counterpart, but rather as a continuation and improvement of the human being in the face of death.[5]

In the eighteenth century, the android finally came of age: La Mettrie's *L'Homme Machine,*[6] Vaucanson's *Mechanical Duck,* Kleist's *On the Marionette Theater,* E. T. A. Hoffmann's *Olimpia* from the *Sandman,* Mary Shelly's feeling monster in *Frankenstein,* the *Maschinenmensch* in Fritz Lang's *Metropolis,* and Ernst Jünger's *Worker,* as well as the vast collection of robotics fanta-

2. John Amos Kominstky (Comenius), *Orbis Sensualium Pietus* (Nürnberg, 1657).

3. René Descartes, *Traité de l'homme,* 1662. According to legend, Descartes himself constructed an android, *ma fille Francine,* that could do somersaults on a tightrope—a substitute for his own illegitimate daughter of the same name? The excellence of his artistry proved to be the undoing of this feminine miracle machine: A terrified captain threw the machine overboard out at sea.

4. Thomas Hobbes, *De homine,* 1658.

5. Ernst H. Kantorowicz, *The King's Two Bodies* (Priceton: Princeton University Press, 1957).

6. Aram Vartanian, ed., *La Mettries L'Homme Machine* (1747): *A Study in the origins of an idea* (Princeton: Princeton University Press, 1960).

sies of our century are all branches of a development, stemming perhaps from the Jewish metaphor of the Golem, warning against self-deification. Even if today nobody knows how consciousness[7] functions, the android seems to reemerge in the attempt to produce artificial intelligence on the internet.[8]

The motivation for these large-scale attempts to combine technology and art and breathe life into them stems from male uterine envy, as well as the demiurgic self-deification of the artist. At the core of artistic motivation, however, we also find the fantasy of overcoming the limitations of our own bodies. This manifests itself, in part, in a desire to achieve immortality through machines.

B. Virtual Illusions

The seemingly unprecedented phenomenon of virtual reality actually rests on a deep tradition within the history of art. While this tradition manifests itself in various ways depending on the subject matter and media of a given period, its core idea reaches all the way back to antiquity and has been expansively revived in contemporary VR-art.[9] This kind of virtual reality insulates viewers from other impressions, surrounding them with a spatially and temporally illusory environment that completely fills the field of vision. The immersive cult frescos of the Pompeiian *Casa dei Misteri* (60 B.C.), Baldassare Peruzzi's *Sala delle Prospettive* in Rome (1516) and the *Sacri Monti* movement (1500–1650) represent stages of this aesthetic vision.

Historically, VR has been used not only for private fantasies, but also as a forum for public spectacles in religious and political life. An outstanding

7. John R. Searle, "Das Rätsel des Bewußtseins: Biologie des Geistes—Mathematik der Seele," *Lettre International* 32 (1996): 34–43.

8. See Luc Steels, ed., *The Artificial Life Route to Artificial Intelligence: Building Embodied, Situated Agents* (Hillsdale, N.J., 1995); Thomas S. Ray, *An Approach to the Synthesis of Life* in Margaret A. Boden, ed., *The Philosophy of Artificial Life* (Oxford: Oxford University Press, 1996), 111–145. Also dealing with the hope for culturally meaningful digital transmissions, Richard Dawkins, "Mind Viruses," *Ars Electronica 1996, Memesis: The Future of the Evolution* (Vienna: Springer, 1996), 40–47, as well as Kevin Kelly, *Out of Control* (London: Forth Estate, 1994).

9. O. Grau, "In das lebendige Bild: Die Virtuelle Realität setzt der Kunst neue Spielregeln," *Neue bildende Kunst* 6 (1997): 28–35.

example appeared at the beginning of the sixteenth century near Varallo in northern Italy on the slopes of the Sacro Monte: an artificial installation exhibiting the stations of the life of Christ, including the Nativity, Crucifixion, and Resurrection. The idea was to present the public not with a picture of the contemporary Jerusalem, but rather with a complete simulation of the sacred places as they are described in the Bible and in Augustine's *Meditations.*[10] On the way up the mountain, believers could begin to imagine themselves on a pilgrimage. Once they reached the top, they were surrounded by the virtual environment. Through eleven dioramatic stations, pilgrims experienced the life of Christ from the *Annunciation* to the *Last Supper,* and in seventeen further stations they experienced dramatic events from the *Capture in Gethsemine* to the *Pietà.*[11] Two main impulses motivated this massive media project: the conviction that direct experience with one's own eyes would provide an enduring buttress of faith, and the assumption that the Ottoman Empire's advance would soon make pilgrimages to Palestine difficult or impossible.[12] Prominent humanists and Franciscans guaranteed the historical authenticity of the graphic arrangement and the accordance of the installation with the particulars of the Holy Land. The success was overwhelming: Visitors came by the thousands, day after day, even from foreign countries.[13]

The most famous virtual installation on the Sacro Monte, the *Calvary* (1518–1522), was created by Gaudenzio Ferrari (figure 13.1). Ferrari was much admired by his contemporaries and placed in the company of Raffael, Michelangelo, and Leonardo.[14] He adhered to a strict naturalistic style. His

10. For a contemporary variation on this theme, see "Jesus 2000.com: The virtual pilgrim to the Holy Land" at http://www.jesus2000.com.

11. Anonimo, *Tractato de li capituli de passione: Questi sono li misteri che sono sopra el Monte di Varale,* Milan, March 29, 1514.

12. George Kubler, "Sacred Mountains in Europe and America," ed. Timothy Verdon, in *Christianity and the Renaissance: Image and Religious Imagination in the Quattrocento* (New York: Syracuse University Press, 1990), 415.

13. Canon Torrotti, according to Samuel Butler, *Ex Voto* (London: J. Cape, 1928), 21.

14. The contemporary aesthetic theory demanded along with the life-like representation of proportions, colors and perspective, especially the conveyance of passion (*moto*). See G. Paolo Lomazzo, *Trattato dell'arte della pittura, scultura ed architettura* (Rome 1844) (1584). It was Gaudenzio Ferrari,

Figure 13.1. Thomas A. Edison: Telephonoscope, 1879, illustration. Photothek des Kunstgeschichtlichen Seminars Hamburg.

creations were made in the service of *techné* conditioned by the ideal of *mimesis.* Some of his life-size, color, terra-cotta figures wore real clothes and wigs, and even had glass eyes. At the core of his exhibition method was the illusory fusion of the three-dimensional foreground with the two-dimensional fresco—a sort of *faux terrain* that blends fresco and foreground into each other. The chapels could be visited at night by torch light, heightening the illusion's impact. Monks leading the pilgrims through the installation found it necessary to continually remind them that this was not the real Jerusalem. This *Gesamtkunstwerk* came into direct contact with the observer and conveyed an immersive presence that involved the pilgrims both physically and psychologically in the distant events. The success of this powerful image complex was so enduring that the coming years saw the appearance of a whole series of *Sacrimonti.* The project was propelled, not in the least, by a desire to use the spectacle to counter the then-approaching

who represented the category *moto* in Lomazzo's *Tempio della Pittura.* Lomazzo, *Idea del Tempio della Pittura,* Bologna 1785 (Milan, 1590), 40.

Reformation. The installations were used as a sort of shield embracing the onlookers with powerful images and manipulating their inner visual memory.[15]

In Mannerism and the Baroque period, chambers of illusion were *en vogue.* Towering realms of fantasy and deception constructed with the traditional devices of the plastic arts found their fullest flourishing in the panorama, patented in 1787. The panorama was the medial dinosaur, tele-visor, and mass entertainment sensation of the nineteenth century. The huge photo-realistic canvasses—circular, hanging, and often larger than 7000 square feet—hermetically enclosed onlookers. The central aim was to transpose the onlooker into the image, so that the picture was no longer perceived as a picture. The representations of nature provided visual totality and allowed journeys through time and space—a complete universe of illusion. The effect was so intense that already around 1800, it was argued that the illusion could impair one's ability to perceive reality.

The budding age of tourism, an age preoccupied with a longing for distant places, found in the panorama its most perfect witness.[16] These rotundas brought the world to the metropolises of Europe and North America and, for many, became a cheap surrogate for physical presence abroad. Being telepresent with the eyes was compared with actual travel and many preferred the former to the latter.[17] In *Blackwood's Magazine* from 1824, we find the following report:

What cost a couple of hundred pounds and half a year half a century ago, now costs a shilling and a quarter of an hour. Throwing out of the old account the innumerable miseries of travel, the insolence of public functionaries, the roguery of innkeepers, the visitations of *banditti,* charged to the muzzle with sabre, pistol, and scapulary, and the rasciality of the custom-house officers, who plunder, passport in hand, the

15. Especially after the Council of Trent, they followed a strategic iconographic program against the Reformation: Orta (1576), Crea (1589), Varese (1589), Canavese (1602), Graglia (1616), Oropa (1620), and Domodossola (1656). The *Sacrimonti* movement spread throughout Italy and was eventually exported to France, Portugal, Spain, Mexico, and Brazil.

16. Silvia Bordini, "Paesaggi e Panorami: immagine e immaginazione del viaggio nella cultura visiva dell'Ottocento," *Ricerche di Storia dell'Arte* (1982): 15, 27ff.

17. On the convenience of technologically mediated experience, see Albert Borgmann, "Information, Nearness, and Farness" (this volume).

indescribable disagreements of Italian cookery, and the insufferable annoyances of that epitome of abomination, an Italian bed.[18]

Even the sober evaluations of Alexander von Humboldt assert that the panorama could almost "supplant a trek through diverse climates. The rotundas supersede all techniques of the stage because the observers, as if trapped inside an enchanted circle and removed from all of the interference of reality, envision themselves to actually be in the foreign environment."[19]

The tendency toward illusionism has provided the essential motivating factor behind new developments in media. Almost every new medium of illusion evolved from arrangements that pushed the potential limits of a currently existing medium. The development of illusory media has been marked by an exchange between large-format immersion spaces that fully integrate the body (frescoes, panoramas, stereopticons, Cineorama, Omnimax- and IMAX-Cinema, and the CAVE) and personal devices held directly in front of the eyes (peepshow images, stereoscopes, Stereoscopic Television, Sensorama, and HMD). VR marks the search for an interface that ideally appeals to all senses and occupies them as immediately and imperceptibly as possible, as if the illusion were a real experience.[20] Contemporary leaders in the virtual arts, such as Char Davies, Monika Fleischmann (GMD), and Christa Sommerer and Laurent Mignonneau (ATR), with their pioneering research installations, are once again combining art and the natural sciences, helping to create and reflect the most complex methods of polysensual illusion. With this development, we witness the historical return of the type of artist who is both artist and scientist.[21]

18. *Blackwood's Magazine* 15 (1824): 472f.

19. Alexander von Humboldt, *Kosmos: Entwurf einer physischen Weltbeschreibung,* vol. 7., ed. Hanno Beck (Darmstadt: Wissenschaftliche Buchgesellschaft, 1993), 79.

20. M. Slater et al., "Depth of Presence in Virtual Environments," *Presence: Teleoperators and virtual Environments* 3, no. 2 (1994): 130–144; J. Freeman et al., "Effects of Sensory Information and Prior Experiance on Direct Subjective Ratings of Presence," *Presence: Teleoperators and virtual Environments* 8, no. 1 (1999): 1–13.

21. C. Sommerer and L. Mignonneau, eds., *Art@Science* (New York: Springer, 1998).

C. Rejecting the Body

A prehistory of attempts to effect presence in distant places (i.e., telepresence) cannot avoid the image. Before the "invention of art," the image was understood to be loaded with occult powers that connected us to remote objects and beings. We can see this in the German word for image, *Bild,* and its etymological germanic root *bil. Bild* represents not so much the specifically graphic as something that is permeated by an irrational, magical, and spectral power that cannot be fully understood or controlled by the observer.[22] The quality of telepresence found in cult images reveals itself in evidence of their liveliness: blood, tears, and miracles attributed to these images.[23] In belief systems that rely heavily on images—voodoo, for example—images and puppets are credited with the power to work miracles and magic over great distances. Images allow for direct interaction with the gods, and secure presence and power for that which is represented.[24]

Various imaging technologies have similarly been viewed as able to traverse spatial, temporal, and even metaphysical boundaries. In the medieval and early modern periods, the mirror was reputed to make possible extraordinary types of observation. In 1646, Athanasius Kircher described a cylindrical mirror that through an artificial alteration made it possible to show the *Ascension of Christ* hovering in open space.[25] A universal mystery allows the fortune teller to make out distant or future events by looking in a mirror.[26] The mirror's supposed powers were not limited to observation: Mirrors were also thought to make possible long-distance agency. According to legend, mirrors can destroy entire fleets by fire or make them visible beyond the horizon. A mirror belonging to Pythagoras was said to project every-

22. Alfred Wolf, *Die germanische Sippe bil: Eine Entsprechnug zu Mana* (Uppsala: Universitets Årsskrift, 1930), 18–56.

23. Hans Belting, *Bild und Kult* (Munich: Beck, 1991).

24. In pre-Columbian Mexico, worshipers would kill the image of the God that they were trying to influence in the human sacrifice, just as in voodoo a being that is not physically present is addressed and manipulated through the medium of the image.

25. Athanasius Kircher, *Ars magna lucis et umbrae* (Rome, 1646) X.3.3, 896–900. Like Agrippa, Kircher was obsessed by the art of telegraphics. His projections used solar equipment and he was able to project over a distance of five hundred feet. He hoped to reach distances of up to twelve thousand feet with larger equipment.

26. Benjamin Goldberg, *The Mirror and Man* (Charlottsville: University Press of Virginia, 1985), 7.

thing written upon it in blood onto the surface of the moon.[27] The sick were advised to cover up their mirrors so that their souls could not fly away and escape to another sphere of existence.

The *Cinéma Telegraphique* (1900) and the *Telephonoscope* (1879) of Thomas A. Edison (figure 13.2) remained technological fantasies. Even before the invention of movies, these projects envisioned the transmission of moving pictures. At the turn of the century, a British couple was said to be able to communicate with their daughter on the colonial British island of Ceylon by means of a large format screen that they hung over their fireplace instead of a painting. Other representations displayed the faces of terrified observers, who were transported into the middle of a distant battle via telematics. The "seeing machine" of Adam Riess (1916) stands as a precursor to the webcam (figure 13.3). Riess connected a camera to a machine that could send electric image signals over the telephone lines to be retranslated into an image at the other end.[28]

By the 1930s, the notion of telecommunication had been fused with the notion of artificial life to form a powerful new vision of a disembodied human self. Italian Futurists envisioned a metallic body that would gain vitality through mechanical impulses. Thus, Marinetti did not only want to overcome death, but also (with the aid of radiophony, a form of cordless telegraphy) to increase massively the body's sensual perceptions. Taste, touch, and the sense of smell were supposed to expand to the point of being capable of receiving stimuli over enormous distances.[29] In his book *God and Golem* (1964), Norbert Wiener envisioned the possibility in principle of translating the very essence of man into code and transmitting it over telephone lines. Over and over again, we project our image of humankind into the most current, yet uncharted and limitless potential of a given level of technological advancement. In search of the substance of man, we hope to realize the essence of life in projections of utopian technologies.

This striving continues today. We yearn for omnipresence—a state of transcendence, a variation of gnosis. It is a sign of uncertainty that myths

27. Jurgis Baltrusaitis, *Der Spiegel: Entdeckungen, Täuschungen, Phantasien* (Giessen: Anabas, 1996), 328.

28. C. Riess, *Sehende Maschinen* (Munich: Hubers Verlag, 1916).

29. "La Radia, Futuristisches Manifest vom Oktober 1933," *Vom Verschwinden der Ferne: Telekommunikation und Kunst,* ed. Peter Weibel and Edith Decker (Cologne, 1991), 224–228.

Figure 13.2. Front cover of Adam Riess's *Sehende Maschinen* [*Seeing Machines*] (Diessen: Hubers Verlag, 1916).

are once again appearing on the scene. They provide models of comprehension that undoubtedly stem from religion.[30] The idea of the transcendental abandonment of the body follows from the primeval notion of the migra-

30. As original as they might at first seem to be, some exponents of cyber-culture fall into well-worn historical tropes. Pierre Lévy envisions "a transcendental 'collective intelligence' as the future source of human consciousness" and a kind of *meta-language* springing from direct global communication. Pierre Lévy, *L'intelligence collective. Pour une anthropologie du cyberspace* (Paris: Éditions La Découverte, 1995).

Figure 13.3. Gaudenzio Ferrari, *Calvary,* diaromatic mixed-media installation, Sacro Monte, Varallo, 1518–1522.

tion of souls, as expressed in Buddhism or in the *Upanishads.* These belief systems propound the involution of the spirit in the material, metempsychoses or reincarnation.[31] Religions,[32] esoteric faiths,[33] parapsychology,

31. Krishna proclaims, "Only the body is transient, within it dwells the eternal soul." Krishna, *Bhagavadgita: Des Erhabenen Sang* (Jena: Diederichs, 1922), 2, 18. The term *avatar,* the mental traveler, comes from Sanskrit. Geoffrey Parrinder, *Avatar and Incarnation* (London: Faber and Faber, 1970).

32. The oldest passage in the Judaic corpus mentioning heavenly ascension seems to be the "Ethiopian" book of Henoch. In Greece, ideas regarding the astral nature of man appear for the first time in the second half of the fifth century B.C.E.

33. Along with *telepathy,* we should mention the notion of personal duplication that is indigenous to the esoteric milieu.

and apocalyptic sects are all searching for ways to overcome the physical. They view human existence as a transitional stage on the path toward pure spirit. We find the notion of the immortality of the soul at least as early as Plato.[34] Hermes Trismegistos describes "[t]he innumerable bodies we must pass through . . . until we are united with the one and only god."[35] Mystical theories propound the existence of another, transcendental reality in the light of which this material world sinks into meaninglessness.[36] Many religions and occult teachings conceive of the immortal soul, or the enduring self, so to speak, as a wispy, untouchable, and, under certain circumstances, even visible apparition. All speak of a being separate from the body. Aquinas regarded it as an essential ability of angels that they be independent of space and time to take on human bodies.[37] The concept of the migration of souls permeates western thinking to various degrees from Giordano Bruno to Swedenborg[38] to Lessing and others. It is an ideology that stands in opposition to the Enlightenment.

Interestingly enough, this utopia of ubiquitous telepresence comes astoundingly close to the contemplation of an all-seeing God. In 1453 Nicholas of Cusa had no doubts that ". . . the absolute vision of God . . . surpasses all of the precision, swiftness and power of all other real observers. . . ."[39] "Your field of view . . . is not of any size but rather infinite, like a circle because your view is the eye of spherical perfection and infinite completeness."[40]

34. Plato, *Phaidon* (Zurich: Rascher 1947), 257, *Meno,* 81b.

35. *Die XVII Bücher des Hermes Trismegistos* (Icking: Akasa, 1964). See also Dionysos Areopagita, *Mystische Theologie und andere Schriften,* ed. and trans. Walter Trietsch (Munich-Planegg: Barth, 1956).

36. "According to the nature of my unborn self, I always was, am, and always will be." Meister Eckhart, *Deutsche Predigten und Traktate,* ed. Josef Quint (Munich: Hanser, 1977), 308.

37. "Cum igitur angeli neque corpora sint, neque habeant corpora naturaliter sibi unita, ut ex dictis patet, reliquitur quot interdum corpora assumant." T. Aquinas, *Summa Theologia,* I, 50, 2.

38. Initially a pioneer of the sciences, Emanuel Swedenborg (1688–1772), according to Kant, gradually became more of a clarivoyant, who perceived the great fire of Stockholm from a distance of five hundred kilometres.

39. Nicholas of Cusa, *Vom Sehen Gottes, Philosophisch-Theologische Schriften,* vol. 3, Leo Gabriel (Vienna, 1967), 93–219.

40. Ibid.

D. Telepistemological Implications

Telepresence combines the contents of three archetypal areas of thought: automation, virtual illusion, and a nonphysical view of the self. These notions collide in the concept of telepresence, which enables the user to be present in three different places at the same time: a) in the spatio-temporal location determined by the user's body, b) by means of *teleperception* in the simulated, virtual image space (the point to which attempts in art history have lead so far to obtain Virtual Reality), and c) by means of *teleaction* in the place where for example a robot is situated, directed by one's own movement and providing orientation through its sensors.

The media-induced epistemology of telepresence seems to be a paradox. Telepresence is indeed a mediated perspective that surmounts great distances, however, perception will soon be enriched in the virtual environment. The so-called "lesser senses" will be amended (feeling, smelling and even tasting), thereby eradicating the abstracting and term-generating function of distance. The three-fold nature of telepresence raises fundamental questions in telepistemology, questions about how distance affects our capacity for knowledge and discovery. Aesthetic theories since the eighteenth century have seen distance as a precondition for reflection, self discovery, and the experiencing of art and nature. (This is distance understood primarily as the accrual of overview and not, in a more ordinary sense, as physical separation.) In his intellectual collaboration with Ernst Cassirer,[41] Aby Warburg stressed the intellectual, awareness-raising power of distance in his *Mnemosyne Atlas.*[42] The result of this physical and psychological distancing from the phenomenon is a conceptual space *(Denkraum)*—the precondition for awareness of an object distinct from the conscious subject. It seemed to him that this was already threatened at the beginning of our century by the sudden proximity created by the telegraph.[43] This idea

41. Cassirer, *Individuum und Kosmos* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1963 [1927]), 179.

42. Warburg, "Einleitung zum Mnemosyne-Atlas," ed. Ilsebill Barta Fliedl and Christoph Geissmar (Vienna: 1991), 171–173. Erwin Panofsky emphasized the central function of perspective for the construction of the ego and personal space. "Die Perspektive als Symbolische Form," *Veröffentlichungen der Bibliothek Warburg.* (Berlin: Teubner, 1927), 287.

43. Warburg, *Images from the Region of the Pueblo Indians of North America* (Ithaca: Cornell University Press, 1995 [1923]).

was inherited and expanded in the theories of aesthetic distance offered by Adorno,[44] Jonas,[45] and Serres.[46]

Telepresence is not, however, always seen as a barrier to reflection and self-discovery. In contrast to Warburg stands Paul Valéry, whose "The Conquest of Ubiquity" predicted long-distance transmission of sense-experiences. A kind of spiritual father of McLuhan, Valéry envisioned an art medium that, like electricity or tap water,[47] could be available everywhere to relay polysensual stimuli:

> Works will attain a kind of ubiquity. Reacting on our call, works of art will obediently present themselves anywhere at any time. They will cease to exist only in themselves, but will be present anywhere, wherever there is someone and a suitable set of equipment. . . . We [will] find it completely natural . . . to receive these extremely swift mutable images and oscillations out of which our sensual organs . . . will make up all that we know. I do not know if there has ever been a philosopher who dreamed up a company specializing in the free home delivery of sensually perceptible reality.[48]

If we did not know that these comments were written in 1928, they could be describing contemporary net-based telepresence. It seems as though soon a fusion of all the senses with a virtual image machine will produce a compelling illusion of intimate bodily closeness for the spatially distant observer. In the animated image, the observer is electronically present at light-

44. Adorno wrote: "Distance is what nearness to a work's substance requires first. In the Kantian term of indifference, which demands an aesthetic behavior that does not seize the object, does not devour it, this is noted. . . . Distance, concerning the phenomenon, transcends the mere existence of a work of art; its total nearness would be its total integration. (transl. O.G.)] Adorno: *Ästhetische Theorie* (Frankfurt: Suhrkamp, 1973) 460.

45. H. Jonas, "Der Adel des Sehens: Eine Untersuchung zur Phänomenologie der Sinne" (1954), in *Organismus und Freiheit: Ansätze zu einer philosophischen Biologie* (Göttingen, 1973), 198–219.

46. Michel Serres points out that only in the fixed artwork whose elements the onlooker "sets into motion" does the spatial configuration become a vivid sensuous event. Serres, *Carpaccio: Ästhetische Zugänge* (Reinbek: Rowohlt, 1981), 152.

47. Valéry, "Die Eroberung der Allgegenwärtigkeit," *Über Kunst,* Frankfurt/Main, 1973), 47 (trans. O.G.).

48. Ibid.

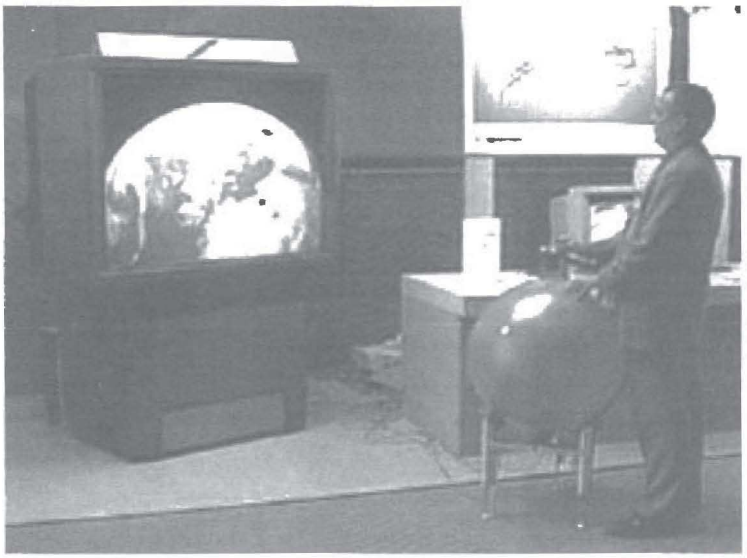

Figure 13.4. *T-Vision* by ART+COM (1995–1999). Courtesy of ART+COM: http://www.artcom.de

speed, via robot, possibly at several locations simultaneously. Telepresence is transforming the classical perception of space, which had been linked primarily to physical location. The immediate local subject of experience is superseded by the locationless, ubiquitous telerobotics-user. Distance as Cassirer described it is giving way to Valéry's notion of visual and tactile experience provided on demand anywhere, anytime.

Today we are on the threshold of change in regards to a location-oriented concept of persons. Telepresence has far-reaching consequences for work, culture, law, and politics. However, there is hope for a global shift in consciousness. Impetus for this was formulated a few years ago with the Gaia-perspective. The telepresence installation *T-Vision* by ART+COM (1995–1999) attempted to visualize this by aesthetic means. The entire face of the earth was generated out of topographical data and satellite images. Using a level of detail to manage scene complexity, the work presents a model of the earth as seen from a million kilometers above its surface, or at the level of desktop in Berlin (figure13.4).[49] It's a bit like Eric Davis described it:

49. www.artcom.de/projects/t_vision/welcome.en

"Spinning the earth, you feel like a god; plunging toward it's surface, like a falling angel."[50]

Simon Penny's *Traces* (1999) is still a work in progress, but it promises to take an important step toward an art of telepresence. *Traces* is a project for three networked CAVEs in Tokyo, Bonn, and Chicago. Users see (or will see) large virtual spaces, hear spatially distributed sound, and experience vibrations through the floor. The user interacts with gossamer traces that have movements and volumes, but are translucent and ephemeral. Each CAVE will use stereo cameras to construct real-time body maps of its inhabitants. Following Penny's concept, the interaction will take "the form of real-time collaborative sculpturing with light, created through dancing with telematic partners."[51] Consequently, *Traces* will give users the opportunity to experience a dispersed body and to interact with traces of other remote bodies. The division of body and mind is not only easily traced back to the dualistic conception of human beings, but also to the Gnostic tradition of devaluing corporeality. According to this conception, the spirit is simulated to an increasing extent, whereas the body is restrained in its function of getting sensual knowledge of the world, generally by tactile experiences through skin.[52] The experience conveyed by machines replaces the real body, and with it embodied experience. By networking various technobodies, telepresence makes possible a multitude spaces of experience and bodies. Those might even be set up to provide the user with logically inconsistent experiences. The ability to move with and through different bodies intensifies this paradox.

The desire to overcome physical distance, to project ourselves outside the constraints of our own physical bodies, has always been a powerful motivation for both art and technology. It has spurred us to develop extraordinary robotic and telecommunication technologies, and to conceive of technologies that are more extraordinary still. It has inspired art that strives to bring about what the technology itself could not realize. Telerobotics and the

50. E. Davis: *Techgnosis: Myth, Magic + Mysticism in the Age of Information* (New York: Harmony Books, 1998), 305.

51. http://imk.gmd.de/docs/ww/mars/proj1_4.mhtml

52. Regarding a cultural history of the skin. Claudia Benthien, *Haut: Literaturgeschichte—Körperbilder—Grenzdiskurse* (Reinbek: Rowohlt, 1999).

Internet mark the latest stage in this development, a union of fact and fiction that is both technological and artistic.

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