# Technologically[1] Mediated Lifeworld

*Understanding the connection between science and technology is an essential step toward creating a more humane technoscience in the future.*

By Arun Kumar Tripathi

As humanity[2] and its technologies have progressed, they have also become more intertwined -- until the contemporary notion of self extends far beyond bone and sinew[3], into outer space and cyberspace. Technology has become an essential part of who we take ourselves to be, influencing our beliefs and desires, our plans and goals, our visions of what we are, have been, and might yet become. Our identities are to a great extent determined by the roles we play. And these roles are often created and constrained by -- if not wholly dependent upon -- our technology. In its many forms, technology is both something we create -- an expression of our understanding and our mastery of the world -- and something that recreates us, fashioning new roles and reshaping old ones.

The patron goddess of practical knowledge in ancient Greece was *Techne*, whose name gives us our words "technique" and "technology". One of the Greek words for art is *techne* -- she is also its goddess -- and the Greek word *tikein* (to create) is derived from her name. This etymology reveals a deep connection between technology and the practices of living and creating -- it is the relationship between humanity and the making of technology, guiding scientists and engineers to develop a moral standard[4].

Science, Technology and Society (STS) studies combine the philosophical study of the meaning of technology in human life with the study of ethics, politics, history and sociology of science and technology[5]. STS studies are dedicated to analyzing science and technology, their development, and their impact on the society and as

---

[1] The title of the paper is inspired by Don Ihde's book "Technology and the Lifeworld" and his works on the mediation between philosophy of science and philosophy of technology in the contemporary philosophy.

[2] Courtesy to the workshop on "The Tools Symposium: Technology and the Making of Humanity," University of Idaho, in May 2001.

[3] die Sehne

[4] Carl Mitcham critics of Technoscience

[5] In other words, it is called as Sociology of Scientific Knowledge: SSK

well as understanding of the interaction of science, technology and society. How does science affect the society? How does society affect the development of science, the concepts and metaphors it deploys, the kind of knowledge it produces? How do theories change in science? What are the relations between science and technology? What are the social and moral responsibilities of scientists and citizens living in a society in which science and technology are so important? STS studies include the traditional disciplines of anthropology, design, geography, history, philosophy, political science, sociology, and social psychology. Theoretical approaches encompass critical policy studies, cognitive sciences, cultural theory, ethics, linguistics/semiotics, political economy, simulation/ethno mathematics, and social theory. Objects of study range from the material to artificial worlds. Research within STS studies has focused on the environment, health, information technology, ethics, engineering, technology transfer, biotechnology and design.

Scholarly studies of STS relations have tended to see scientists and engineers as closely identified with, and not very critical of, technoscience, as proponents and apologists, not critics. This is a mistake. In fact, a significant minority of scientists and engineers have been fundamental critics of numerous aspects of technoscience. Gaston Bachelard coined the term technoscience in his early works on contemporary science, which reflects the binding of late modern science to its technologies and is a term used by many writers including Bruno Latour[6], Donna Haraway[7], Andrew Pickering[8] and Don Ihde[9].

Bachelard approached the working practice of the sciences from a peculiar perspective. Already in his early books of the 1930s Bachelard emphasized that modern sciences are to be understood as "phénoméno-techniques," that is, as enterprises which technically address and shape their objects of investigation in the laboratory. As a rule, these objects are not easily accessible with the means of everyday experience. In a paper[10] Professor Hans-Jörg Rheinberger claims that "in an inversion of the Cartesian epistemology of the evidence of clear and distinct ideas, what were traditionally recognized as the most simple and basic scientific

[6] We Were Never Modern (HUP, 1993)
[7] Modest Witness@Second Millenium (Routledge, 1997)
[8] The Mangle of Practice (Uni. Of Chicago Press, 1995)
[9] Expanding Hermeneutics (NUP, 1998)
[10] Bachelard and the Notion of "Phenomeno-Technique"

phenomena, Bachelard saw as the most derived phenomena, because they were most subjected to the phenomeno-technical work of purification." Rheinberger argues that it is characteristic of Bachelard's epistemology of the detail that it thematizes a certain inertia and blurredness inherent in the very act of gaining knowledge under the concept of an "epistemological obstacle."

The history of science is filled with important theories and discoveries based upon observations of technologies -- for example, thermodynamics comes from the steam engine, as historians claim. Ihde develops the concept of technoscience by examining several cases of life-world practices which relate to scientific developments, including cannon warfare and ballistics, railway schedules and clocks for special relativity, etc. Later Ihde focuses upon technologies that become explicit models for knowledge production. Ihde examines the role of the camera obscura (See **History of Camera Obscura** below) for early modern epistemology and then the "return of the book of life" for contemporary epistemology.

The increasing popularity of the term technoscience as a description of the relations between science and technology is also suggestive of other ways in which science and technology are entwined. Historians of science have a saying: "Science owes more to the steam engine than the steam engine owes to science." Historically, the steam engine developed without much explicit use of scientific theory; yet it inspired the ideas of entropy and the second law of thermodynamics. The machine, not raw nature, suggested the phenomena.[11]

Technoscience is now most commonly used to refer to recently emerged sets of activities inadequately described either as science or as technology, whether because in them these two different kinds of activity are inextricably intermingled, or because the particular activities themselves have a hybrid form. What, though, do we understand by science, and by technology? For Bruno Latour the monolithic category technoscience is useful because it allows him to emphasise the broadly similar features of science and technology. Edwin Layton, on the other hand, chooses to distinguish science from technology (in order to defend the latter's autonomy). But for him, too, technology is a unitary entity. Many historians of technology, however, have drawn attention to the diverse forms that technology

[11] Epistemology Engines: An antique optical device has powered several centuries of scientific thought, Don Ihde in Nature, Vol. 406, 6 July 2000.

has taken, whether as a form of knowledge or practice (e.g., in the extent to which engineering has drawn upon scientific theory). The problem is that very few have yet attempted to account for such diversity.

Technoscience, in its contemporary meaning, applies to the sciences which are technologically embodied and which produce knowledge through instruments and technologies. Thus it is necessary that in addition to the previous histories of theory and speculation, one must also explore the histories of technologies to deeply understand science. Carl Mitcham has shown the interdisciplinary and cultural embeddedness of technologies and Don Ihde has shown how the natural sciences are also framed by technologies and interpretative techniques. Indeed, Ihde has recently argued that even ancient science (astronomy) has since its beginnings entailed the uses of technologies in measuring perceptions to produce lasting knowledge. And although the Renaissance enhanced and re-introduced close relationships between science and technology, earlier periods such as in the Hellenic and Islamic periods also showed this same close relationship. In contemporary times, the interactions of science and technology have become so intertwined that the term "technoscience" seems most appropriate.

The most important philosophical questions today concern how to live with and criticize science and technology. The merger of science and technology, sometimes called technoscience and in fact the influence of technoscience on all aspects of life and world[12] constitute the distinctive character of our historical period.[13] According to Mitcham, the important factor of technoscience is, "the dialectic between acceptance and criticism, between yes and no, which constitutes the human condition."[14]

Don Ihde has written several books on philosophy of technology, phenomenology and technoscience and culture from a phenomenological-hermeneutic perspective. His research interests are philosophy of science and technology; of sociology of science and technology; of historical development of imaging in science and other professions; of imaging in modern hi-tech professions. Ihde is leading the technoscience research group at Stony Brook. The study of technoscience

[12] Husserl founded the notion called as "Lebenswelt" (Lifeworld)
[13] Carl Mitcham, Thinking through Technology, University of Chicago Press, 1994
[14] Similarly, Peter Janich developed the thesis of Misslingen and Gelingen (Success & Failure) in his works

examines cutting edge work in the fields of the philosophies of science and technology, and science studies. The technoscience research group (TRG) with its affiliated technoscience research seminar is the only postgraduate-graduate technoscience research program within the Department of Philosophy at Stony Brook. TRG includes active researchers from interdisciplinary sources both within Stony Brook and from external and international sources.

Participants to the technoscience seminar, read only living authors (such as Donna Haraway, Bruno Latour, Ian Hacking, Andrew Pickering, Sandra Harding, etc.) and occasionally Ihde has invited other authors to the seminar on technoscience for a "roast" (roastees have included Peter Galison, Hubert Dreyfus, Albert Borgmann, Andrew Feenberg). The seminar on technoscience has already resulted in a number of publications related to its activities and participants regularly present research results at major international conferences (Aarhus, Denmark; Vienna, Austria; CERN, Switzerland, etc.). Ihde has authored 12 books to date, the most recent of which have been *Expanding Hermeneutics: Visualism in Science,* (1998) and *Postphenomenology* (1993). His latest book, *Bodies in Technology* is published by University of Minnesota Press. *Bodies of Technology* spells out the original exploration of the ways cyberspace affects the human experience. The book is useful to those research scholars who are exploring the role of bodies in the virtual reality. The book is the study of embodiment in cyberspace, and an ideal book also related to human-computer interaction. Ihde explores the meaning of bodies in technology, that how the sense of our bodies and our orientation in the world is affected by various form of information technologies. The research of Ihde is important to the humanist scholars because it provokes a new approach to the study of how to use and integrate computers and technologies for the humanity. Ihde's work is important to unveil the research in how the concepts of physical, digital, virtual, partial and cyber identity will be used by the citizen, the nature of the impact that these will have in shaping the e-society, and how these need to be defined in order to respect the fundamental rights of the citizen. His interests develop around the philosophy of science and technology, with special recent interests in imaging technologies as well as work on intercultural perception and plural cultural patterns. In *Bodies in Technology* Ihde sketches a phenomenology of embodiment, touching on virtual reality, prosthetic extension, and other variations. Ihde focuses upon the ways in which human embodiment is reflexively implied in instrumentation. Ihde shows

examples taken from historical and contemporary science instrumentation, and shows how, only since the mid-twentieth century, there has been a scientific revolution which is at least as momentous as the earlier one between pre- and early-modern science. The role of visualization, computer tomography and other processes will also be illustrated.

Ihde's *Technology and the Lifeworld* explores some of the most crucial issues relating to the role of technology in daily life in the contemporary and multi-cultural world. The role of tools and instruments in our relation to the earth and the ways in which technologies are culturally embedded provide the foci of this thought-provoking book. In the book, Ihde begins by comparing life in a nontechnological imagined "garden" with our experience in the technologically mediated world. Ihde then offers three programs for understanding the variety of human involvement with technologies. Drawing from the traditions of phenomenology and hermeneutical philosophy, the first program analyzes the diversity of human-technology relations[15] and shows the extent to which technology is nonneutral. The second program takes up the issue of technology as a cultural instrument, in part through a discussion of indigenous technologies, technology transfer, and neocolonialism.

STS methodological studies can also be seen in the book, *Thing Knowledge; A Philosophy of Scientific Instruments* in which Davis Baird invites readers to use instruments to do philosophy. Western philosophers have traditionally concentrated on theory as the means for expressing knowledge about a variety of phenomenon. The book challenges this very fundamental notion of showing how objects themselves, specifically scientific instruments, can express knowledge. Author Davis Baird gives us the tools to "read" the material products of science and technology and to understand their place and relationship in our culture.

**Philosophical, Hermeneutic, design and STS Perspectives on Hi-tech Realities**

Imaging in scientific and other professional culture has radically changed in its history. Today's images range from apparent isomorphic depictions to highly

[15] Don Ihde; Phenomenology of Technics, Expanding Hermeneutics: Visualism in Science, Northwestern University Press, 1998

constructed ones, which are often composites created by computer processes. They are neither representations nor texts in the usual senses. But they are hermeneutic objects that call for interpretive activity. Indeed, the richer these images are for showing interesting phenomena to professionals, the more the construction is needed for the "image". The contention is that this is no longer a process which works well for "modernist epistemology"; rather it calls for a much more "postmodernist hermeneutics" to be understood. Human embodiment is presupposed in and by our technologies, particularly those related to the production of knowledge, including scientific instrumentation, communication technologies, and the new forms of virtual reality, simulation and modelling devices, all of which are discussed in *Bodies in Technology*. In an article[16] Dr. Daniel Faellman presents the notion of computing named Embodied Systems. In this article, the author suggests that this concept will move the computer devices from the desks to the users' bodies. The author addresses the notion of computing by the term "Embodied Systems", drawing on the concept of embodiment as seen and understood by phenomenologist philosopher Ihde.

Ihde retains the notion of "intentionality" from classical phenomenology, as he takes it to be much more like the Deweyan concept of a contextual, inter-relational process akin to an ecological organism-environment notion, or, alternatively, a relativistic situation in physics whereby the relativity between positions must be taken into account [see *Technology and the Lifeworld* (Indiana, 1990)]. Ihde rejects entirely the Cartesian "homunculus-in-a-box" notion.

Ihde places the phenomenological practice of using variations as the primary "tool" for analysis and claims, "such a variational practice works well to establish both the richness of variety provided in lifeworld experience, and to locate whatever structural features may be found." The best known of Ihde analysis through this kind of practice is *Experimental Phenomenology* (SUNY, reprinted 1986) whereby he elaborates variational range to multistable visual phenomena. A more recent example of this is Ihde's phenomenological variation upon the popular Wittgenstein and Kuhn "duck-rabbit." Phenomenological variational expansion usually produces a richer and more robust notion of most phenomena.

[16] Embodied Systems: Introducing General-purpose Wearable Computers

Embodiment, as phenomenology matured, from the late Husserl on into Merleau-Ponty in one direction, and through Heidegger in another, the emphasis upon embodiment in the first, and a hermeneutics of history and culture in the latter, even further removed phenomenology from the metaphysical traditions.

The paper[17] uses the theory of technoscience to shed light on the current criticisms against the emerging science of artificial life. We see that the science of artificial life is criticized for the synthetic nature of its research and its over-reliance on computer simulations, which is seen to be contrary to the traditional goals and methods of science. However, if we break down the traditional distinctions between science and technology using the theory of technoscience, then we can begin to see that all science has a synthetic nature and reliance on technology. Artificial life researchers are not heretical practitioners of some pseudoscience; they are just more open about their reliance on technology to help realize their theories and modeling. Understanding that science and technology are not as disparate as was once thought is an essential step in helping us create a more humane technoscience in the future.

As soon as the new sciences of complexity, Chaos Theory, and artificial life (hereafter referred to as AL), began to be noticed by the popular science press a kind of "honeymoon" period began. During this time these sciences were seen as the sexy new breakthrough theories that would eventually lead to our ability to solve all the problems of the world, from the cure for AIDS to the complete understanding and synthesis of living systems.

Recently a number of attacks have been leveled against the studies of complexity and Chaos Theory in general and on the study of AL directly. The most damning of these attacks on AL has been launched by John Horgan in his article "From Complexity to Perplexity," printed in *Scientific American* (Horgan 6/95) and in his book *The End of Science.* In his article Horgan fiercely criticized the study of AL with the implication that the entire study is some kind of sham. Horgan states that:

"Artificial Life -- and the entire field of complexity -- seems to be based on a seductive syllogism: There are simple sets of mathematical rules that when

followed by a computer give rise to extremely complicated patterns. The world also contains many extremely complicated patterns. Conclusion: Simple rules underlie many extremely complicated phenomena in the world. With the help of powerful computers, scientists can root those rules out (Horgan 6/96, Pg. 107)."

In his very last written communication, a letter to the American Heidegger Conference two weeks before his death, Heidegger reaffirmed the importance of the question of the relationship between science and technology. The paper[18] re-examines Heidegger's philosophy of science with a reappraisal of what was innovative, and what remained archaic. Heidegger then is read against the background of the "new" approaches to science in science studies, and against the background of the scientific revolutions that have occurred since the mid-20th century.

In an interview[19] Ihde explores future perspectives[20] of *Philosophy of Technology*, by giving replies to the questions: What is the relationship between philosophy of technology with philosophy (traditional philosophy) in general? Is technology raising an issue for philosophy? Is the philosophy of technology today finding an independent place in the philosophical discipline? What is the status of the philosophy of technology today in the disciplines? What is the comparison between his [Ihde] views and Husserls' method of *Wesenanschauung*? What is his [Ihde] emphasis on the embodiment esp. to the human embodiment? What is the relationship between epistemology with human experience? What is meant by theory of technologically mediated perception and technologically mediated embodiment (technologische eingebettet Leiblichkeit)? How human embodiment is implicit includes in a different kind of practices (pragmatic activities)? What is meant by not having a human body *(nicht Leibhaben; Körperhaben),* but being a human body *(Leibsein*) and how far this distinction does make the difference?

Ihde examines what might he called a material hermeneutics[21] which characterizes much practice within the domains of technoscience. Ihde rejects the

---

[17] Synthetic Biology: The Technoscience of Artificial Life by John Sullins
[18] Ihde, Don. "Was Heidegger prescient concerning Technoscience? *Existentia* (An International Journal of Philosophy) 373-386 VOL. XI / Fasc.3-4
[19] http://www.sunysb.edu/philosophy/new/research/ihde_2.html
[20] http://www.filosofi.net/artikler/donihde.pdf
[21] Expanding Hermeneutics: Visualism in Science, Don Ihde (Northwestern University Press, 1998)

vestigial Diltheyan division between the humanistic and natural sciences[22] and argues types of critical interpretation, broadly hermeneutic[23] characterizes both sets of disciplines. Ihde examines what he calls a style of interpretation based in material practices relating to imaging technologies which have given rise to the visual hermeneutics in technoscience studies.

The contributions[24] of Ihde to the philosophy of technology, now going back more than 30 years, were a direct development from the phenomenology. In contrast to Husserl, who rarely referred to technologies -- excepting his insights about writing and of measurement practices -- it was more Merleau-Ponty and Heidegger who suggested a possible line of development. Ihde referred to this work which includes an analysis of Merleau-Ponty's blind man's cane and the feather-hatted woman, and extensively with respect to Heidegger's tool analysis [see *Technology and the Lifeworld* (Indiana, 1990)]. Following these ideas, Ihde early developed his "phenomenology of technics" which describes a series of human-technology relations and which is widely anthologized. In short, from the '70s on Ihde included technologies in the consideration human experience in its pragmatic-phenomenological sense. The technologies Ihde wished to question in the philosophy are the radical, new imaging technologies that began to be developed only since the mid-twentieth century and which today are radically transforming the sciences that use them. Ihde found these technologies highly philosophically provocative because imaging raises all the right epistemological questions which revolve around representational versus non-representational knowledge; it raises questions about constraints posed by human experience and embodiment; and it raises questions about the role of a hermeneutic styled philosophy which arises in both pragmatist and phenomenological traditions. [Preliminary work can be found in *Expanding Hermeneutics: Visualism in Science* (Northwestern, 1999)]

Ihde plausibly criticizes current trends in philosophy and of philosophers in the contemporary world as he writes, " … most philosophers are caught in an old academic model in which conversations with each other are the mode, disengaged

[22] Would hermeneutics contribute to bridging the gap between natural sciences and humanities?
[23] What does hermeneutics mean for scientists, who may find themselves in hermeneutic situations?
[24] The Unity of Practical and Theoretical Reason: Pragmatism and Phenomenology in the Philosophy of Technology (Lecture given by Don Ihde in Dresden's Philosophy Colloquium during June 2004 at TU Dresden)

from today's primarily research activity model of a university and subsequently insulated into a situation of self-replication and often irrelevance."

On the other side, in order to call attention to the neglected dimension of the technoscientific community, Carl Mitcham[25] reviews four contexts in which scientists and engineers have advanced, from the 1950s through the 1990s, basic moral criticisms of technoscience, i.e. the Pugwash movement, the Federation of American Scientists (FAS), the Bulletin of Atomic Scientists, and the Union of Concerned Scientists (UCS). Dr. Stephen Cutcliffe[26] traces the beginnings of STS[27] in the 1960s as academics and activists responded to the more hideous consequences of technology in late 20th century American life: the devastation of the Vietnam war, pesticides in agriculture, automobile construction. Within the Euro-American community of philosophers relating hermeneutics to science there is a considerable disagreement about where hermeneutics may be located. The older traditions hold that hermeneutics apply to and are limited to the social, cultural, and historical dimensions of science.

Hermeneutics has to do with understanding and the conditions for understanding a text or a person or a situation. In philosophical hermeneutics, the historical character of understanding is posited: one always already understands in a certain way and this shapes the questioning that one does. Understanding is dialogical, a dialogue of question and answer, and one moves toward reaching an understanding with the person or writing in a process of question and answer and eventually a fusion of horizon. Newer approaches of hermeneutics claim that hermeneutics applies to the very praxis of science and to the constitution of scientific objects. Historically, Ihde[28] turns to a hermeneutic recuperation of science, first by drawing from the hermeneutic approach of Joseph Rouse, and then by the hermeneutic constructionism of Bruno Latour. Ihde finally turns to what he calls technoconstruction in science, particularly in imaging processes, to show concrete cases of the hermeneutic preparation of scientific objects.

---

[25] Carl Mitcham, Humanity and the Making of Technology: Scientists and Engineers as Moral Critics of Technoscience

[26] Visions of STS: Counterpoints in Science, Technology, and Society Studies, edited by Stephen Cutcliffe and Carl Mitcham (published in SUNY series in *Science, Technology, and Society*, 2001)

[27] See, Albert Borgmann: Technology and Character of Contemporary Life (University of Chicago Press, 19984)

[28] Don Ihde, Expanding Hermeneutics: Visualism in Science (NUP, 1998)

Contemporary science has exceeded its earlier modernist framework and now operates in a constructionist-hermeneutic framework.

In the 1500s and 1600s (with the Scientific Revolution led by such figures as Galileo, Bacon, Descartes, and Newton) and again in the 1800s (with Darwin) conflicts arose between science and religion; these conflicts have continued into the present. In the late 1700s and 1800s (with the Industrial Revolution led by inventors such as Watt) special problems arose for economics and politics; these problems have been resolved by neither capitalism, socialism, nor democracy. Professor Mitcham claims, "The 20th century advent of nuclear weapons, electronic computers, and biotechnologies -- followed by 21st century globalization -- have only intensified multiple challenges that range across issues of personal belief and social justice to nuclear risk, environmental pollution, cultural integrity, and self-identify." Mitcham further states: "Issues of professional ethics and responsibility among scientists and engineers, as well as science and technology policy, are further dimensions of STS studies."

**Revolution in Techno-Science for the Contemporary World**
**Imaging Technologies: Science as Visual Hermeneutic**

Although optical technologies such as the camera obscura and lenses were known since Medieval times (Cf. noted by Al Hazen 1038), imaging technologies became much more central to science practice since the 19th and, particularly, mid-20th centuries. Ihde in *Imaging Technologies* examines the trajectories that first were dominated by "isomorphic" representations in early modern science, to the multiple trajectories of imaging processes in 20th century developments. Ihde illustrates that a philosophical examination of the implicit and explicit epistemologies shows that there needs to be an account that moves away from modern representationalist epistemology to a more "praxis-perception" model of knowledge production. Reframing imaging technologies as implicit phenomenological hermeneutics is claimed as a more adequate model for the understanding of science practice. The development of optics brought about a whole new picture of reality. Early Greek philosophers already knew that what they called "visual rays" had properties; Euclid that they travelled in straight lines; Aristotle that they inverted themselves as he observed on the ground the upside-down image of a solar eclipse; and Ptolemy that different materials had

different reflectance properties. Only centuries later, when Al Hazen (965-1039) and Roger Bacon (1214-1294) reopened the quest for the properties of light, did instruments specifically designed to use light came to exist.

**History of Camera Obscura**

The Camera Obscura, is as derived from the Latin word *camera* meaning "room" and *Obscura* meaning "dark" or translated as "dark room". The phrase is credited to have been first used by the German astronomer Johannes Kepler in the early 17th century. The Camera Obscura is a natural effect of physics that if a small hole is made in the wall of a completely darkened room, an inverted image of the scene outside the window will be produced on the opposite wall of the room. This is due to the fact that light travels in a straight line and when some of the rays reflected from a bright subject pass through a small hole in thin material they do not scatter but cross and reform as an upside down image on a flat surface held parallel to the hole. This is also true for a very small hole in a dark box will direct light to create an image inside the box turned upside down, which formed half of the basis for the discovery of photography. Light-sensitive material formed the other half.

The physics of pinhole reflection of the outside world from a darkened room dates back to the Chinese philosopher Mo-Ti in the 5th century, BC. Mo-Ti called this darkened room a "collecting place" or the "locked treasure room." Aristotle in 384-322 BC, also understood the optical principle of the camera obscura. It was first described outside China by the Arabian scholar Alhazen of Basra about 1030. Then Leonardo DaVinci more famously documented it in 1490 in his notebooks. Others like Dutch scientist Reinerus Gemma-Frisius used a camera obscura in 1544 for observing a solar eclipse. In 1558 Giovanni Battista Della Porta in his book Magiae Naturalis recommended the use of this device as a drawing aid for artists. Many of the first camera obscuras were large rooms and then compact boxes. Later in the 16th century the box camera obscuras were improved with the addition of a convex lens into the aperture, which provided for better image quality. The latter addition of a mirror was used to reflect the image down onto a viewing surface. The developments of the camera obscura's box design matured by the early 1800's so as to allow it to accept light-sensitive materials without much modification and aid in the discovery of photography. Darkrooms, parabolic

mirrors, and lenses were objects of amazement if not cult, and many faced prison and death for heretically playing with nature and truth by such means. Bacon in his Opus Magnus had foreseen how "pictures could be projected in the space, into air, where they could become visible to the multitude". Ali Al-Hazen ibn Al-Haytham was an expert in philosophy, physics, mathematics and the knowledge of medicines. He was also a great discoverer in optics. Before Ali, people thought that we could see only for the reason that our eyes emit light, which comes back to our eyes after reflection from the objects. Most of his research work is on light that he described in the 10-11th century is now tested and proven as exact, according to the latest knowledge using latest techniques. He concluded the rule of magnification using concave and convex lenses and mirrors. He is the person who first found the relationship between light source, lens and resultant image. That is what is called "Al-Hazen Theorem". He also explained how an eye can see. He said that we can only see when light falls on that object and reflects back to our eyes.

**Albert Borgmann[29] coping with Don Ihde**

In this section, I will undertake Dreyfus's terminology of coping to compare Montana philosopher Professor Albert Borgmann with Ihde. Coping is the Dreyfus interpretation of Heidegger's use of coping with technological developments and instrumentation with relation to the world[30].

Borgmann discusses broadly the questions: How can one experience oneself as an integral part of nature -- not at a conceptual level, but as an actual experience? And how have we lost the experience of our connection with nature? -- in his trilogy[31] based on *Philosophy of Society and Culture and Technology and Ethics*.

---

[29] Significant study of Borgmann's philosophy of technology as *the rule of the device* is done by Drew Leder (*Philosophy Today,* Spring 1998, pp. 17-30)

[30] Martin Heidegger (In-der-Welt-Sein) and Maurice Merleau-Ponty (Zu-der-Welt-Sein) attempted each in his own way, to work out an account of human Being-In-the-World through which the untenable idealistic conclusions would be overcome, but both of them failed at critical junctures.

[31] Technology and the Character of Contemporary Life: A Philosophical Inquiry. Chicago: University of Chicago Press, 1984; 5th printing 1997.
Crossing the Postmodern Divide. Chicago: University of Chicago Press, 1992; 5th printing 1998. Chinese translation 2003.
Holding On to Reality: The Nature of Information at the Turn of the Millennium. Chicago: University of Chicago Press, 1999.

Borgmann's thesis is that as we increasingly take up with the world through our work, leisure activities and family time, in a technological manner, our capacities as human beings atrophy and our experiences of the world are diminished. His analysis is much richer and insightful than I can convey. He welcomes the expansion of technologies that ease human suffering, eradicate disease and lift the drudgery of unskilled burdensome labour from workers. He's also interested in technology that sharpens human experiences of the world such as new materials for musical instruments. There's no list of appropriate or inappropriate technologies. Instead, he arms the reader with a set of concepts that give one the eyes to see what is gained and what is lost when one opts to jog on a treadmill in one's living room rather than being a moving body through a landscape; reckoning with the wind, the inclines; the riches and challenges associated with the particular season.

While doing the review of Ihde's *Technology and the Lifeworld: From Garden to Earth* Albert Borgmann precisely put "there is the background relation between humans and technology where a technology, such as air conditioning, has receded into the inconspicuous normalcy of daily life. Ihde's tools properly occupy a pivotal position in his latest work, namely, the very middle of *Technology and Lifeworld*." (pp. 340)[32]

Scholarly professor Borgmann wants us to pry ourselves free and grasp actual reality. With its uniqueness, and great in weight and "burden" it will command our serious attention. On the other side, virtual reality merely requires our fast-fingered manipulation. Plausibly, Borgmann argues that, the flood of information today threatens to overflow, suffocate and even obliterate actual reality.

In a philosophical sense, consumption is the unencumbered use of glamorous commodities. Borgmann provides in *Technology and the Character of Contemporary Life* a unique way of conceiving of the inherent limitations of technology for the betterment of life by an explication of the "device paradigm." According to Borgmann, the promise of technology for improving the quality of life has turned out to be inherently limited, and that technology must be seen for what it really is and what it can offer while distinguishing it from "focal things and practices" that can provide the requirements necessary to achieve fulfilment in

life. Technology[33] is the kind of life in which enlightenment has been shaped by a promise of liberty and prosperity.

"Philosophers of technology tend not to celebrate technological achievements, because they get celebrated all the time", says Borgmann by emphasizing the problem of how to tame the technological development. Borgmann further elaborates, "Philosophers point out the liabilities, what happens when technology moves beyond lifting genuine burdens and starts freeing us from burdens that we should not want to be rid of."

On how technology shapes a way of life, Borgmann further argues, "A crucial feature of a technological device is that it makes something available to us in a comfortable way. You don't have to work for it." The main concern of Borgmann is thus: How do we gather technological devices together into the good life? Nothing by itself makes a better life. For Albert Borgmann, philosophy is a way of taking up the questions that reside at the center of everyday life, esp. questions that are urgent but often inarticulate. The philosophy of technology, which has been the principal focus of his work since the mid-1970s, is about bringing to light and calling into question the technological shape and character of everyday life.

The first book published in the pragmatic philosophy of technology series, Larry Hickman's *John Dewey's Pragmatic Technology* (1990), shows that Ihde was not interested, in the series, in pushing his own phenomenological approach to philosophy of technology, but is open to a variety of approaches[34]. Ihde's own approach shows up in his later books, *Existential Technics* (1983), *Consequences of Phenomenology* (1986), and *Technology and the Lifeworld: From Garden to Earth* (1990), even in *his Philosophy of Technology: An Introduction* (1993), though that textbook does present other views. In general, one can say that Ihde's development is a matter of greater depth and clarity in his phenomenological analysis, though *Technology and the Lifeworld* gives more than a passing nod to the centrality of environmental concerns.

---

[32] Research in Philosophy and Technology, 13 (1993)
[33] Reply to the Symposium on Albert Borgmann in Paul Durbin (ed.) *Technology and Contemporary Life* (P.34)
[34] Vielfältigkeit der Technik; Borgmann interpretation of Ihde thesis of philosophy of technology (German translation)

Ihde (1979, 1983, 1990, 1993), who is perhaps next only to Mitcham and possibly Borgmann, -- has been widely praised by SPT members. His appearances at SPT meetings are only a tiny fraction of the appearances Ihde makes and the talks he gives all over the world. About Ihde, Mitcham says: "[He] not only wrote the first monograph on philosophy of technology in English, he has also produced the most extensive corpus devoted to the subject and has established a book series devoted to philosophy of technology" (1994, 78). On the other hand, Mitcham also raises questions about Ihde: "In light of the importance he gives to technology in human experience, his strong sympathies with pragmatism, and his criticisms of the critics of technology, ... it is not clear to what extent his phenomenological philosophy of technology is truly other than a sophisticated and subtle engineering philosophy of technology" -- as opposed to the "humanities philosophy of technology" that Mitcham favors.

Ihde[35] writes, "Technology can no longer be taken for granted. Its impact on and implications for the social, ethical, political, and cultural dimensions of our world must be considered and addressed."

From a hermeneutical perspective, Ihde characterizes the "existential import" of technologies in terms of "world reflexivity," which he describes as follows: "Humans interpret their world in terms of some focused interpretation. … But because humans are also existentially and necessarily related to what they perceive as their world, they 'bring it close' so that ultimately they also interpret themselves in terms of their world" (Ihde, 1979, p. 64). As a consequence of world reflexivity, a notion that Ihde later expands (Ihde, 1983), and because computing technology becomes prominent in many activities, humans tend to interpret themselves in terms of this technology, leading to notions such as "the brain is a computer," and "human intelligence can be simulated by computing machines." Thus, a noticeable effect of this technology is that through processes of self-interpretation and world-reflexivity it affects the views that human users of technology have of themselves and of the world.

Can we say something more about the relation that constitutes technology? Perhaps we can use some Ihde's ideas, who has read Martin Heidegger as a scholar of phenomenology and who is also under the influence of pragmatism

(Ihde, 1979 and 1983). In his book, *Technology and the Lifeworld* (1990), he focuses on human-technology relations and the cultural embeddedness of technologies. Following a relativistic ontology he draws a distinction between the "direct bodily and perceptual experiences of others and the immediate environment" and "technologically mediated experiences" (Ihde, 1990, pp. 15 ff.). And he suggests as I proposed above that we look for different degrees of mediation in our technologically textured world. The position that conceives of technology as instruments to transform something can be blamed as a Cartesian and subjectivist bias. It is supposed that a self or a subject can use a thing as an instrument to effect something in the outer world. But is it reasonable to speak of a subject, if the technological instruments change the status of subjectivity? Who is the subject in an atomic plant? The clear-cut limits between subject and object become disturbed. "Technics is a symbiosis of artifact and user within a human action" (Ihde, 1990, p. 73). The material relation between humans and the world should be conceived as a symbiotic and mediated relation instead of as a divided and instrumental one.

The late 20th century seems marked by a deep intellectual discomfort about the ways in which Western thought generally has framed its ways of understanding the world. One symptom of this dis-ease revolves around the current philosophical debates that see either a dramatic end to, or a winding down from "modernity." Are we postmodern? a-modern? or, were we, as Bruno Latour claims, never modern to begin with*? (Expanding Hermeneutics* by Don Ihde, NUP, 1998)

Instrumental Realism has three principal aims: to advocate a "praxis-perception" approach to the philosophy of science; to explore ways in which such an approach offers a mutually illuminating overlap with a philosophy of technology; and to examine comparatively and critically the work of some who advocate an "instrumental realist" approach to the philosophy of science.

Experimental Phenomenology has already been lauded for the ease with which its author explains and demonstrates the kinds of consciousness by which we come to know the structure of objects and the structure of consciousness itself. The format of the book follows the progression of a number of thought experiments which mark out the procedures and directions of phenomenological inquiry.

---

[35] Philosophy of Technology: An Introduction, Don Ihde (1979)

Making use of examples of familiar optical illusions and multi-stable drawings, Ihde illustrates by way of careful and disciplined step-by-step analyses, how some of the main methodological procedures and epistemological concepts of phenomenology assume concrete relevance. Such formidable fare as epoche, noetic and noematic analysis, apodicticity, adequacy, sedimentation, imaginative variation, field, and fringe are rendered into the currency of familiar examples from the everyday world.

In his *Technics and Praxis* Ihde explicitly emphasized the necessity of a social embedding of technology and science, as Hans Lenk[36] and Günter Rophol[37] did independently in the seventies including what Ihde calls (social) "praxis" as well as a new interpretation. Ihde did more comprehensively emphasize *the technological embodiment of science* in a literal sense, not only but notably also in "its instrumentation" seeing "a crucial difference" between modern and ancient science (Ihde: 1979, 1991). Ihde epitomizes "the focal point at which instrumental realism emerges" as being "the simultaneous recognition of what I have called the technological embodiment of science, which occurs through the instruments and within experimental situations; and of the larger role of praxis and perception through such technologies" (1991, 99).

With *Existential Technics,* Ihde advances his reflections on the role technology plays in human life. Heretofore primarily the province of Continental thinkers, philosophy of technology is a growing preoccupation of North American philosophers. This collection of essays is a philosophical reflection on and critique of human experience from a clearly American perspective guided by phenomenological analysis. This book is divided into three parts. The first, technics, deals with human interaction with technology and its existential effects. The remaining sections on perception and interpretation examine the imaginative use of phenomenology in the visual and auditory realms of art, music, and intercultural perceptions, and are followed by discussions of contemporary hermeneutics and deconstruction theory, particularly in the thought of Heidegger and Derrida.

[36] Zur Sozialphilosophie der Technik, Frankfurt a.M. 1982: Suhrkamp
[37] mit Hans Lenk (Hrsg.) Technik und Ethik, Stuttgart, 1987, 1989: Reclam

**Maurice Merleau-Ponty and the Body/World & Ihde Hermeneutics and Phenomenology**

Maurice Merleau-Ponty (1908-61) was one of the most insightful and historically influential of 20th-century phenomenologists. His earlier writings developed an existential phenomenology of perception, behaviour, and the body-as-lived in order to attempt a viable alternative to Cartesian and, later, Sartrian, dualisms as well as the deterministic causality of classical science and behaviourism. In this regard he benefited greatly from his critical reflections on, among others, Hegel, Bergson, Husserl -- especially the later Husserl on *Crisis*; Heidegger, Scheler, Sartre, and Beauvoir. Merleau-Ponty also drew extensively on the experimental and experiential evidence in Gestalt psychology which, he showed, had effectively falsified its reliance on deterministic causality.

Throughout many subsequent published books and articles Merleau-Ponty also developed the implications of his phenomenology of embodied existence[38] for understanding speech, language, sexuality, art, history, politics, and expression generally -- in short, all areas of the Lifeworld that involve the creation of meaning. In this regard, he was aided by his critical analyses of Ferdinand de Saussure's structural linguistics and Marxism, and, with regard to the latter, in such a way as to create a final break with Sartre. Merleau-Ponty's last writings[39] abandoned phenomenology as a method for overcoming Cartesian[40] dualisms, and instead sought to develop an ontology of "flesh" of which "body" and "soul" were only twin aspects. This ontology, which begins to take shape in "Eye and Mind" and his lecture courses at the Collège de France, became the subject of the manuscript left unfinished by Merleau-Ponty's untimely death and which was published posthumously as "The Visible and the Invisible". Within this ontology human existence achieves a much closer and more profound relationship with nature of which it is part. Merleau-Ponty's philosophy anticipated many of the themes found in contemporary continental thought. His influence is evident in the work of Derrida, Foucault, and others in the post-modern or post-structural tradition.

---

[38] Merleau-Ponty devotion to the World as "Zu-der-Welt-Sein" -- an extension of Heidegger's "In-Der-Welt-Sein"

[39] Visible & Invisible and The Eye and Mind

[40] Kind of Cartesian Epistemology

Merleau-Ponty places the body at the center of ontology. "I am" because I have a body. It is from the body that I perceive the world. Without a body, I have no place from which to perceive the world. "Where is" begins with the location of the body. It locates me in a place. Merleau-Ponty suggests that we enjoy the use of the body not only in so far as it is involved in a concrete setting, [we] are in a situation not only in relation to the tasks imposed by a particular job, [we] are not merely open to real situations [i.e., actual]; we are open to those verbal and imaginary situations [i.e., virtual or abstract] which we can choose for ourselves or which may suggested to us in the course of an experiment.
(Merleau-Ponty, 1965, p. 108)

On the other hand, empiricism claims that consciousness is shaped by the transcendent world. By the transcendent world, we mean the world outside of human experience. But this is a problem. If all we can know is the transcendent world, which is outside of experience, how will we know that we've found what we're looking for once we find it?

Merleau-Ponty begins with the everyday, lived engagement with the world (what Heidegger would call the "ready-to-hand")[41]. Merleau-Ponty begins his phenomenology by giving primacy to perception. The phenomenologist, says Merleau-Ponty, returns "to the world which precedes (scientific description), (the world) of which science always speaks, and in relation to which every scientific characterisation is an abstract and derivative sign language as is geography in relation to the countryside."

For Merleau-Ponty, consciousness is not just something that goes on in our heads. Rather, our intentional consciousness is experienced in and through our bodies. With his concept of the lived body[42], Merleau-Ponty overcomes Descartes' mind-body dualism without resorting to physiological reductionism. Recall that for Descartes the body is a machine and the mind is what runs the machine. For Merleau-Ponty the body is not a machine, but a living organism by which we body-forth our possibilities in the world.

[41] Zuhandenheit (Heidegger's terminology)
[42] Corp vecu (Merleau-Ponty's terminology)

The current of a person's intentional existence is lived through the body. We are our bodies, and consciousness is not just locked up inside the head. In his later thought, Merleau-Ponty talked of the body as "flesh," made of the same flesh of the world, and it is because the flesh of the body is of the flesh of the world that we can know and understand the world.

To demonstrate this concept of the lived body, Merleau-Ponty uses the example of the phantom limb. A phantom limb would not be possible if our bodies were just machines. If a part of the machine were severed from the rest of the machine, it would simply go without using the limb. Yet, people who have a limb amputated still feel the limb, and they are still called to use the limb in situations that call for its use, even though it is no longer there. In this same sense, the whole-lived body is an intentional body, which is lived through in relation to possibilities in the world. Even when the limb is gone, the possibilities for its use remain, but are unable to be taken up as a project in the world. This is why the phantom limb phenomenon is so awe-ful; the arm is gone, and yet the person still feels the call to use it.

For Merleau-Ponty, however, the body cannot be understood as separate parts but must be understand as a whole, as it is lived[43]. The body as it is lived is an experiential body, a body that opens onto a world and allows the world to be for us. Physiology is not pointless; it has value, no doubt. But it does not get at the lived body. If we want to understand the body as it is lived in our experience, we have to use a phenomenological method. The idea of the lived body allows Merleau-Ponty to resolve Meno's paradox. The body is both transcendent and immanent. It is the "third term" between subject and object. I know that transcendent things exist because I can touch them, see them, hear them. But most importantly, I never know things in their totality, but always from an embodied perspective. Because I am a body, I can only see things from a certain perspective, and yet, because I am a body, I can also experience the thing as being more than that partial perspective.

[43] Whole body experience (whole body perception): Don Ihde interpretation of Merleau-Pontean's concept of body

Richard Avenarius[44] elaborated the problem of the natural conception of the world. This is related to the natural world later in Husserl the *Lebenswelt*, the world of our life. Husserl was first to see clearly that the question of the natural world has to do with something that is familiar yet remains unknown, that the natural world must be discovered, described, and analyzed. Secondly, he discovered that the natural world cannot be grasped in the same way that natural science grasp things, that it requires a fundamental change of attitude, an orientation that focuses no longer on things but on their phemenal nature, the way they manifest themselves. Husserl's phenomenology represents a concurrent reflection about the meanings of things and about the meanings of human life. What makes Husserl's approach distinctive is that it seeks to be rigorous science and it singles out such rigor not only as one instance but as the central most important and profound access to meaning.

On the other side, by *Three Worlds of Merleau-Ponty* Maurice Merleau-Ponty wouldn't mean World One is "the realm of physical things and processes" World Two is "the realm of subjective human experience" and World Three is "the realm of culture or objective knowledge." -- as Karl Popper meant in his work. In his book, "Phenomenology of Perception", Merleau-Ponty never distinguishes three worlds explicitly. The article [Hubert Dreyfus & Samuel Todes: "The Three Worlds of Merleau-Ponty*", Philosophy and Phenomenological Research* (June 1962)] distinguishes the pre-conceptual world (minimal figure ground experience), the everyday perceptual world, and the world studied by natural science.

According to Merleau-Ponty, in everyday, absorbed, skillful coping, acting is experienced as a steady flow of skillful activity in response to one's sense of the situation. Part of that experience is a sense that when one's situation deviates from some optimal body-environment relationship, one's motion takes one closer to that optimum and thereby relieves the "tension" of the deviation. One does not need a goal or intention to act. One's body is simply solicited by the situation to get into equilibrium with it. "Whether a system of motor or perceptual powers, our body is not an object for an 'I think', it is a grouping of live-through meanings which moves towards its equilibrium" (1962: 153).

[44] Richard Avenarius, Der menschliche Weltbegriff, Leipzig, 1981.

Idhe's *Expanding Hermeneutics*[45]*: Visualism in Science* maps my starting point in hermeneutics to which Ihde says that:" … the dominant interpretation of hermeneutics, which is informed by the 'hermeneutics-positivism binary'. From this binary point of view, the natural sciences have a positivist (empirical-analytical) way of understanding and the humanities a hermeneutic (interpretative) one. The former is supposed to be dominated by realism, the latter by relativism: the sciences reveal reality 'as it really is', the humanities develop interpretations." That is how I understand it. Hermeneutics is interpreting people's relationships with the world. Our world is "interpreted reality" and our existence is "situated subjectivity". What the world "is" and what subjects "are", arises from the interplay between humans and reality.

In general, hermeneutics and ethics are two different fields. Hermeneutics has to do with understanding and the conditions for understanding a text or a person or a situation. In philosophical hermeneutics, the historical character of understanding is posited: one always already understands in a certain way and this shapes the questioning that one does. Understanding is dialogical, a dialogue of question and answer, and one moves toward reaching an understanding with the person or writing in a process of question and answer and eventually a fusion of horizon. Ethics, on the other hand, involves some system for doing the right thing, for making a choice that is in harmony with the good one recognizes. In Kant, one starts from certain principles: autonomy, freedom, respect for law, etc. In Mill, one starts with a definition of the good as pleasure, and the goal of utilitarian ethics is the greatest good for the greatest number.

Hermeneutical ethics would, I think, have to take its lead from the task of understanding, of not making a decision before full and careful understanding of the situation and of the imperatives that guide one's own life. It would require self-understanding first, i.e., clarity about one's values and goals in life. On the basis of this self-understanding one would make a decision for oneself as to what is right in a given situation. Deciding for someone else would require an in depth understanding of the other person and the good for the other person.

[45] See chapter 3. Philosophy of Technology as Hermeneutic Task & Chapter 5. Singing the World: Language and Perception for preliminary explanation

Modern hermeneutics is known as the theory of interpretation. As hermeneutics in its modern form has been shaped by a number of recent major movements -- including life-philosophy, phenomenology, and existentialism -- we will also be learning something about a wider spectrum of intellectual currents in continental philosophy. Narrowly conceived, hermeneutics is concerned with developing a methodology for the study of humans and their creations. It is so conceived, it has interesting things to say about art, anthropology, historiography, literary interpretation, political theory, and so forth. More broadly conceived, hermeneutics is "hermeneutic ontology," an attempt to understand the being of humans -- the entities who understand -- and their creations. Hermeneutics, a method of textual analysis, means to interpret. Hermeneutics is an artful form of understanding and a process of exposing hidden meanings. Historically, hermeneutics has been associated with the interpretation of biblical texts. This presentation will provide a historical background of hermeneutics. The evolution of hermeneutics will be discussed, as well as the philosophical influences of Husserl, Heidegger, and Gadamer.

A close link between phenomenology and hermeneutics has resulted in the terms often being used interchangeably and universally. However, philosophical beliefs differ among phenomenologists and hermeneutic philosophers. Phenomenologists focus on the lived experience of persons eliciting commonalities and shared meanings, whereas hermeneutics refers to an interpretation of language. Yet, there is no absolute or universal definition of either hermeneutics or phenomenology. These perspectives will be compared and contrasted by summarizing the philosophical assumptions of Edmund Husserl, Martin Heidegger, and Hans-Georg Gadamer. Concepts such as bracketing, prejudice, horizon, historical consciousness, and hermeneutic circle will be explored. A blending of critical social theory and hermeneutics has resulted in a methodology of critical hermeneutics. This methodology emphasizes an interpretation of language, as well as silence, while also situating the text and the interpreter in their socio-cultural traditions.

Bernhard Irrgang and Nestor Corona in the book *Technik als Geschick?,* elaborate the model of a technical action (technisches Handeln) within a cultural and social context. This kind of model of action also explores the model of a technical development in our society and can be implemented in engineering sciences and

be the basis of an ethical act. First of all, Corona/Irrgang's model investigates the meaning and model of technical action with respect to their development from the cultural and social perspectives. Artefacts like tools, machines or technical structures are the consequences of technical action. They are used for certain purposes and to realise certain goals. This process is defined as the forms of collective technical action and is also oriented with respect to certain forms of technological ethics (Technikethik). This model takes the account of implementation of technical-technological action into the automation and digitisation of technical knowledge in the modern technology. (*Contextual Technical Action* by Corona/Irrgang, 1999).

In describing post-phenomenology, Ihde displays a vast knowledge of subject areas as varied as the history of mapping and navigation, NASA statistical information, technology transfer data, and contemporary trends in the philosophy of science, enabling him to make insightful and innovative connections between topics of interest. Post-phenomenology is an investigation of the relationships between global culture and technology. Ihde applies the unified theory by what he describes as "a concern which arises with respect to one of the now major trends of Euro-American philosophy -- its textism." Ihde writes, "I show my worries to be less about the loss of subjects or authors than I do [there] not being bodies or perceivers." Further, by exploring post-phenomenology Ihde addresses the cultural role of technologies[46] in relations to perception, multiculturalism, and technoscience, and gives special consideration to the impact of image technologies, such as television and cinema, upon the contemporary world. In "Body and Identity in Virtual Space", Ihde concludes the body should not be forgotten or separated from the subject in the new media design, because body is an essential part of our existence[47]. Physicality or corporeality[48] is something that connects us to the world and other people. The ideas of embodied experience and perception and physicality are carried through the extending process, but much more could have been done with them. In terms of the language of embodiment, Merleau-Ponty took account of the way in which technologies may be embodied, such as the blind man's cane or the woman's feathered hat. In the first instance,

[46] Irrgang and Ihde approaches of Hermeneutics of Technology (Cultural Hermeneutics of Technology)
[47] Whole Body Perception, Ihde concept of body based late works of Maurice Merleau-Ponty
[48] Natural Embodied Selves

the cane/roadway touch is what the walker experiences -- his body is extended through the cane, which becomes part of his Here-Body Experience[49].

What sits in the background to this phenomenological description is a technology that constituted a new type of cultural system that restructured the entire social world as an object of control. Technology here is an environment and a way of life. As individuals we adapt to life in a technological environment -- "It took two elevators and an escalator just to grab coffee" -- and our subjectivity is shaped and formed by the technological mode of life. Contemporary life is thus "technologically mediated life." The humanities represent a source of fundamental human skills much needed in a technological age, and the study of humanities in technology shows the interconnection between technology and arts and engineering. Irrgang in his work on the philosophy of technology and hermeneutics ethics pleads that the task of the philosophy is to work out suggestions concerning such basic conditions of technical and economic development. These tasks must lead to the conditions that make life worth living in all the single economic areas, that help to realize regionally valid values, that facilitate income and ensure the surviving of families in the culturally and technologically mediated Lifeworld.

**Cited and non-Cited References**

"Experiencing the World through Interactive Environments," Agustin A. Araya, San Jose State University
http://scholar.lib.vt.edu/ejournals/SPT/v3n2/ARAYA.html

Ihde, Don, "Hermeneutic Phenomenology: The Philosophy of Paul Ricoeur," Northwestern University Press, 1971

Ihde, Don, "Sense and Significance," Humanities Press, 1973

Ihde, Don, "Listening and Voice: A Phenomenology of Sound," Ohio University Press. 1976

Ihde, Don, "Experimental Phenomenology," G.P. Putnam's Sons, 1977, reprinted by SUNY Press, 1986

Ihde, Don, "Technics and Praxis: A Philosophy Of Technology," Boston Series in the Philosophy of Science, Vol. XXIV; Reidel 1979

[49] Concept of extending the Here-Body Phenomenon by Ihde

Ihde, Don, "Technology and the lifeworld. From garden to earth," Bloomington Indianapolis, 1990

Ihde, Don, "Existential Technics," SUNY Press, 1983

Ihde, Don, "Consequences Of Phenomenology," SUNY Press, 1986

Ihde, Don, "Instrumental Realism: The Interface Between Philosophy Of Technology And Philosophy Of Science," Indiana University Press, 1991

Ihde, Don, "Philosophy of Technology. An introduction," Paragon House, New York, 1993

Ihde, Don, "Postphenomenology: Essays In The Postmodern Context," Northwestern University Press, 1993

Ihde, Don. 1998: "Expanding Hermeneutics: Visualism In Science," Northwestern University Press

Ihde, Don. 2002: "Bodies in technology," University of Minnesota Press, USA

Ihde, Don. with Selinger Evan. 2003: "Chasing Technoscience: Matrix of Materiality," Indiana University Press

Ihde, Don: Technoscience and the 'other' continental philosophy in Continental Philosophy," 33: 59-74, 2000, Kluwer Academic Publishers

Ihde, Don: "Thingly heremeneutics/Technoconstructions in Man and World," 30: 369-381, 1997, Kluwer Academic Publishers

Irrgang, B. 2003: "Von der Mendelgenetik zur synthetischen Biologie. Epistemologie der Laboratoriumspraxis Biotechnologie," Technikhermeneutik Bd. 3; Dresden 2003

Corona, Nestor; Irrgang, Bernhard 1999: "Technik als Geschick?" Geschichtsphilosophie der Technik; Dettelbach. ("Technique as the Destiny? History of Philosophy of Technology")

Janich, P. 1992: "Grenzen der Naturwissenschaft. Erkennen als Handeln," München

Janich, P. 1993: "Erkennen als Handeln. Von der konstruktiven Wissenschaftstheorie zur Erkenntnistheorie," Erlangen, Jena

Latour, B. 1987: "Science in Action," Cambridge Mass.

Merleau-Ponty, Merleau 1962: "Phenomenology of Perception," translated from the French by Colin Smith; Routledge Press

Mitcham, Carl 1994: "Thinking through technology. The path between engineering and philosophy," Chicago London

Polanyi, M. 1998: "Personal knowledge. Towards a Post-Critical Philosophy," 1958

Rheinberger, H.-J. 1992: "Experiment, Differenz, Schrift. Zur Geschichte epistemischer Dinge," Marburg

Lenk, Hans: "Towards a Practice-oriented Methodology and Philosophy of Technological Science and Scientific Technology in Festschrift for Don Ihde" (forthcoming by SUNY Press: 2004)

*Arun Kumar Tripathi, Department of Philosophy of Technology, Institute for Philosophy, Dresden University of Technology, Germany*

*Source: Ubiquity, Volume 5, Issue 41, Dec. 23 - 31, 2004, http://www.acm.org/ubiquity/*