

Research Seminar on 22 November 2000

Outline - Handout

Title: Universities: Technology, Society, Universal Internationalism, and Neo-humanism

(based on the World Meeting of University Professors in Rome, Italy, 3-10 September 2000)

Date and time: 22 November 2000, 13:15-15:00

Place: MIT-building, room MC 413

URL: <http://www.informatik.umu.se/seminarier/2000/Sem.Ivanov.001122.html>

1. Introduction, context

1.1. Purpose: to report on my ongoing work, share and test my "forced" formulation of experiences of foreign (different, cf. my original dissertation on quality-control of information) approach to criticism of trends in world-wide university research, and in particular postmodern relativism, as it appears in perspectivism or make-sense interpretivism. Political and ethical presuppositions in our research. The trend toward descriptive vs. normative research. Attacks (as by actor network theory ANT-author) against Platonism. The emphasis on sensation (vs. cognition and vs. systems) in VR and multimedia. Internet communication and its import for democracy. The meaning of democracy. The present way of thinking of earlier leading researchers in cognitive science and AI. "What directs and should direct the development and use of IT." Preparedness for standpoint on e.g. "actor network theory", "critical systems thinking", and "interpretive systemology". My convictions on need for absolute ethical foundations, cf. earlier students' now dormant social ethics (Marx, Habermas) and the rebirth of "the senses", Sophistry and pre-Socratics. Why we can do away with that: the aesthetic (and latest financing structure) of IT. Cf. Amazon Books and Framfab this morning.

1.2. As support for study of the matter of this seminar I have available a package (see below) summarizing the "World Meeting of University Professors" (<http://www.universitas2000.com/eng/>), held on 3-10 September 2000 in Rome with the theme "The University for a New Humanism". The event was organized within the frame set up by the Central Committee of the Great Jubilee of the Year 2000 (<http://www.jubil2000.org/>) with the collaboration of the Italian Ministry for Universities and Scientific and Technological Research.

1.3. I myself participated with a personal contribution, a sample out of last my sabbatical studies on "Platonic information technology" to one (<http://tce.ing.uniroma1.it/istas/istas.html>), organized by the IEEE Soc. Social Implications of Technology SSIT, <http://www.ieee.org/society/ssit>) of the 59 conferences that were held in 21 universities that week, and also participated part-time in another conference (<http://infocom.uniroma1.it/~gjacob/giubileo/iub.htm>). I also happened to be invited "on place" to the First World Meeting of University Rectors and Presidents held on September 8th, where I found out that among 282 rectors and presidents from all over the world, reminding the meaning of true "internationalism" and "peer review", there was only one Swedish regular participant, pro-rector Gunnell Engwall from the university of Stockholm.

1.4. For those interested people who request it, then, I have, available a package consisting of (1) the general program of the world meeting including the 59 conferences and the presentation of summaries in the final meeting of John Paul II with the academic community, plus the call to the related events of the

four world meetings for rectors and presidents, university managers, students, and university chaplains, (2) List of participants to the world meeting of university rectors and presidents, presumably of possible interest only for rectors and presidents if it were not for its challenging the meaning of true "internationalism" (and therefore not included in the distributed copies unless specifically requested) , (3) A sample of texts of lectures given at this latter meeting by participants from China and India, (4) A sample of speeches given the John Paul II and others, plus press reviews or comments of the events with relevance for universities and their mission, plus an interesting article in Swedish by historian Yvonne Werner in Dagens Nyheter 23 August 2000, "Hotet från Rom" explaining why the Swedish intellectual community seems to be often unconsciously disinterested in Catholic academic world culture.

1.5. The 59 conferences mentioned above were generated from or allocated to four areas (reflect on why they were defined as they were] and the experiences and conclusions were eventually summarized by four especially appointed referees: (A) *The human person: Genealogy, biology, biography*, (B) *The city of man: Society, environment, economy*, (C) *The vision of the sciences: Discoveries, technologies, applications*, and (D) *Creativity and memory: Fine arts, literature, music and drama*. To further interested parties, and also upon request, I can distribute material directly related to my discipline and to my contribution, or more detailed material as above but available mainly in Italian and Spanish.

2. My contribution and participation in "my" conference

2.1. Ivanov, K. (2000). Platonic information technology. Reading Plato: Cultural influences and philosophical reflection on information and technology.

2.1.1. In *Proc. of ISTAS 2000, IEEE Int. Symposium on Technology and Society "University as a bridge from technology to society"*, 6-8 September 2000, Rome, Italy (pp. 163-168). New York: IEEE Institute of Electrical and Electronic Engineers' Society for Social Implications of Technology (SSIT). Co-sponsored by the Society for Social Studies of Science (4S), International Sociological Association (ISA) and the European Association for the Studies of Science. Outgrowth of my sabbatical work on applicability of Platonic (and Aristotelian) thinking to current problems of IT basic research. Will be linked to my homepage.

2.1.2. Includes a discussion of definitions of information and technology, and a critique of the basis and implications of so called Actor Network Theory, related to its author's attack on Plato. Not discussed in this seminar but perhaps later upon request, since it presumes the reading of my text.

2.1.3. Interesting contact: Prof. Armin Grunwald, Prof. Dr., Director, Institute for Technology Assessment and Systems Analysis ITAS, Forschungszentrum Karlsruhe GmbH, Technik und Umwelt, Karlsruhe, Tyskland.

2.1.4. Community for "Engineering Ethics", IEEE Institute of Electrical and Electronic Engineers' Society for Social Implications of Technology (SSIT).

2.2. Participation in the conference on Information science and technology for the next century, September 5-6, 2000.

2.2.1. The announcement of the conference

2.2.1.1. The use of modern tools and networks for communications and computation makes the notion of "information" full of meanings, and much more sensible than in the past. As a matter of fact, the "digital revolution" made it clear, also for the non-expert, the fundamental distinction between objects (or structures), and their information content. The notion of information is now widely used both with a real and a metaphorical meaning, and the information is now considered to be a primary good whose production and exchange measures the level of development of human society. Information is also a novel key concept in the scientific understanding of reality. Mathematical and logical theories developed in the area of Theoretical Computer Science, Information Theory, and Communications suggest new techniques and methodologies for a deeper analysis and a better understanding of systems characterized by very complex phenomenologies and structures, such as biological systems, cognitive systems, social and economical systems. In such a scenario the Congress "Information: Science and Technology for the Next Century" has the objective of illustrating and reflecting upon the impact of Information on human life and human culture.

2.2.2. Donald A. Norman

2.2.2.1. President, UNext Learning Systems, Prof. Emeritus, University of California, San Diego, <http://www.jnd.org> (UNext Next University?):

2.2.2.2. "Applying Cognitive Science", and cf. his recommendation of Turner, M. (*The literary mind: The origins of thought and language* . New York: Oxford University Press, 1996). who, in turn, praises Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its*

challenge to Western thought. New York: Basic Books. Norman's abstract: The science of human cognition has made many great strides in past decades. One of the more interesting is in its application to the *design* and development of everyday objects and new technologies...Cognitive science plays an important role in the design and deployment of these technologies in at least two major ways:

2.2.2.3. First. In the design, to ensure that the technology is truly human centered, focusing upon people's needs rather than upon the technology...Cognitive Engineering can greatly enhance these products. Indeed, I have argued for an invisible technology, one in which the goals and needs of people direct the design, with the technology hidden inside, enabling the potential, but keeping out of the way.

2.2.2.4. Second. In some areas Cognitive science has much to say about the practice. Thus, in education the technology enables new pedagogy, permitting effective instruction at a distance, anytime, any place. This has profound implications for the world, because for the first time, education knows no boundaries: it can be delivered across the world, even to remote villages where there would not normally be sufficient population to support advanced courses.

2.2.3. Kim Veltman

2.2.3.1. Discussant of Donald Norman's paper. From my e-mail to informatik about "Science (history) & art" of 17 October 2000:

2.2.3.2. In view of the interests of several people at our department concerning the interface between history of science, science, and art including museums etc., I share a contact I established with prof. Kim Veltman on occasion of my participation in a recent conference in Rome to which also other well known people participated like Donald Norman (cognitive science), Tommaso Poggio and Robert Kowalski (AI). A summary-presentation of Kim Veltman whom I recommend as potentially very interesting, hoping that we will create the opportunity to invite to visit us is found at <http://www.fgi.at/if/autoren/Veltmann-Kim.html>: Kim Veltman is the Scientific Director of the Maastricht McLuhan Institute, a European Centre for Research in Digital Culture; has published two books on Leonardo da Vinci, has produced a standard bibliography on perspective, is the author of 44 sections of books, 20 refereed articles, many in the field of new media, and 15 reviews. In 1996, he was awarded the International Capire Prize for a Creative Future in the area of science and art integration. For the past decade he has been working on a System for Universal Media Searching (SUMS). In 1996 it was chosen as part of G7 pilot project 5: Multimedia Access to World Cultural Heritage and represented Canada at the Information Society and Developing Countries (ISAD) conference in Midrand (May 1996). SUMS is also part of the European Commission's Trans-European Networks (TEN) project, MOSAIC, devoted to Multimedia Access to Europe's Cultural Heritage. A detailed presentation of Kim Veltman is at <http://www.sumscorp.com/cvfull.htm>. An example of stimulating challenge of some of our present design orientations.

2.2.4. Robert Kowalski

2.2.4.1. Imperial College, department of Computing, London, rak@doc.ic.ac.uk: "Artificial Intelligence and the Natural Universe":

2.2.4.2. Until recently, the dominant school of thought in Artificial Intelligence was the symbolic knowledge representation school. Its aim was to develop a computational theory of intelligence in which all thought was represented in logical, symbolic form and all interactions between thoughtful creatures and their environment was understood in terms of logical relationships between sentences describing thoughts and sentences describing the environment. Thinking itself was viewed as a form of symbol manipulation. This approach has given rise to many useful computer applications, including expert systems in areas such as law and medicine, and even in mathematical theorem-proving. *In recent years, however, we have seen a barrage of attacks against the symbolic knowledge representation school.* Attacks by developers of neural networks, who argue that thinking is better implemented by means of highly parallel, non-symbolic neural networks. Attacks also by builders of "situated" robots, who argue that intelligent robots can in many cases function more effectively without symbolic representations, but can be hardwired to react directly to observations of the environment. As is typical of work in Artificial Intelligence, these different schools of thought have engineering, scientific and philosophical implications. Engineering, because they provide tools, techniques and methodologies for building useful applications. Scientific, because they also provide testable theories about the nature of human intelligence. And philosophical, because they can be interpreted more broadly as models of the human condition in general. Now, a number of researchers have begun to work on a new paradigm, which promises to *reconcile the old symbolic approach and its neural network and situated robotics alternatives*. Here are some of the main characteristics of the new paradigm:

2.2.4.3. Even though much of our thinking can be understood as *reactive* "hardwired" relationships between observations and actions, much of our "higher level" level thought is better understood as

proactive reduction of *goals to subgoals*. However, both reactive and proactive thought can be interpreted in logical, symbolic terms. In this logical interpretation, the two main components of an intelligent agent's mental state are its beliefs and goals, both of which can be expressed in logical form. The agent uses its goals to identify alternative courses of future actions. These goals include obligations, prohibitions and condition-action rules. It uses its beliefs to reduce goals to subgoals. Both reactive and proactive thinking generally leaves an agent with a choice of actions to perform. This choice can be made by means of metalevel, rational thought, but ultimately it requires that a commitment be made. This freedom of choice and the resulting commitment is independent from "object-level" reasoning about goals, observations and beliefs. In the extreme versions of the symbolic knowledge representation school, *there was no need for an external reality. Thinking was everything* [cf. Churchmanian Leibnizian inquiring systems]. In the new paradigm, however, there is no denying the existence of an external environment that generates observations that are beyond the agent's control. It could be put this way: "I think, therefore I am. It bombards me with [my?!] observations, therefore it is [cf. Lockean inquiring systems]." Not only is the individual, intelligent agent not alone, because it is situated in its environment, it is not alone also because its environment includes other agents, generally having different beliefs, different goals and different capabilities from itself. These differences can give rise both to opportunities for co-operation and to possibilities of conflict [cf. Hegelian inquiring systems and "contradictions"]. Perhaps it is in this context of promoting co-operation and conflict resolution in multi-agent systems that the new paradigm has its greatest future potential.

3. Some interesting parallel conferences

3.1. "Science and knowledge: Toward which rationality?". Bologna 5-8 September 2000

(http://www.bologna.chiesacattolica.it/giubileo/convegno_internazionale.htm)

3.1.1. The Conference is arranged for all University Professors coming from all over the world and travelling to Rome on the occasion of the University Professors Jubilee. It aims at offering a qualified stage to reflect upon the meaning of one's own researches and teaching. The programme wants to offer a conceptual itinerary: starting with a consideration on the rationality of sciences, it develops both their opportunities and limits inside the scientific world and in its different branches, and then it explores their opening towards wider forms of rationality and knowledge. All that in the light of the historical event which has marked the progressive *separation between natural sciences and philosophy* with meaning questions, but which has also suggested again their renewed approach during recent times. Then, attention will be focused on the relationship between *science, technique and economic progress*, whose implications strongly affect both the present and the future of the university. Finally, interdisciplinary relations among different university disciplines will be evaluated, as well as the opportunity to reflect upon the unity of knowledge and the type of cultural preparation the University is to offer to students nowadays.

3.2. An International Conference on Metaphysics for the Third Millennium, Rome, September 5-8, 2000, http://www.arsap.net/metafisica/ENG_index.htm: Purpose of the Conference

3.2.1. The convergence of metaphysical, religious, socio-political, and scientific modalities of thought is at the core of current developments in human culture. Through this Conference, forming part of the Jubilee celebrations for university professors, an effort is being made to create an international forum marked by intellectual depth and well-grounded conviction which can establish the need for metaphysical thought. This Jubilee event, though arising in the context of the Catholic Church, seeks to remain open to all forms of intellectual sensibility. Speakers are thus being sought who can provide broad reflection on the possibilities for metaphysics, the foundation for all humanism.

3.2.2. About the conference, see also <http://www.egroups.com/group/RomeMetaphysicsForum> and

3.2.3. <http://www.onelist.com/community/RomeMetaphysicsForum> (paper by Nicholas Capaldi in reference list at the end below).

3.3. Preparatory "Faith and Science" Conference, The Vatican, 23-24 May 2000, http://www.vatican.va/roman_curia/pontifical_councils/cultr/documents/rc_pc_cultr_doc_20000525_jubilaeum-scient_en.html

Divisions: (1) Philosophy, theology, science, (2) Natural sciences, (3) Sciences of man and life, (4) Social sciences

Josef Seifert, "Philosophy and science in the context of contemporary culture"

Bruno Forte, "Theology and its relation with experimental science"

Edward Nelson, "Mathematics and faith"

John Rogers Searle "Artificial intelligence and the relation mind-body"

Rubens Ricuperio, "Faith and reason in economics" (author at UNCTAD)

3.4. World Meeting of University Rectors and Presidents, September 8

3.4.1. Secretariat: Foreign Relations Commission. University of Rome "La Sapienza", <http://www.uniroma1.it/comrelint/inexe.html>. For further documentation, please request from me some additional material, including speeches by presidents/chancellors from India and China.

4. Conclusions

4.1. Official conclusions from the jubilee week, e.g.

4.1.1. From a speech and homily to the university teachers: (John Paul II in Osservatore Romano, English ed. N. 37, 13 September 2000, p. 1, 2, 9): You have chosen in the meetings of these days to reaffirm the need for a university culture which is genuinely "humanistic", in the sense -- primarily -- that culture must correspond to the human person and overcome the temptation to a knowledge which yields to pragmatism or which *loses itself in the endless meanderings of erudition*. Such knowledge is incapable of giving meaning to life. That is why you have emphasized that there is no contradiction, but rather a logical connection, between *freedom of research* and *recognition of truth*. It is to truth that all research looks, albeit with the limitations and fatigue of human thought. This is an aspect which needs to be underlined, *lest we succumb to the climate of relativism* to which a large part of today's culture falls prey. The reality is that if culture is not directed towards truth, which must be sought both humbly and confidently, it is *doomed to disappear into the ephemeral* [cf. emphasis on "change"] losing itself to the instability of opinion, and perhaps giving itself over to the domineering will -- though often disguised -- of the stronger. *A culture without truth does not safeguard freedom but puts it at risk...* "The demands of truth and morality neither degrade not abolish our freedom, but on the contrary enable freedom to exist and liberate it from its own inherent threat." ...What is needed if a humanism in which the perspectives of science and faith no longer seem to be in conflict. Yet we cannot be satisfied with an ambiguous reconciliation of the kind favoured by *a culture which doubts the very ability of reason to arrive at truth*. This path runs the risk of *misconstruing faith by reducing it to a feeling*, to emotion, to art: in the end stripping faith of all critical foundation...Faith does not sprout from the ashes of reason...Today the most attentive epistemological reflection recognizes the need for the human and natural sciences to enter into a dialogue once again...You...must make universities "cultural laboratories" in which theology, philosophy, human sciences, and natural sciences may engage in constructive dialogue, looking to the moral law as an intrinsic requirement of research and a condition for its full value in seeking out the truth...In particular it is urgent for us to work to ensure that *the true sense of democracy*, an authentic achievement of culture, is fully safeguarded. In this regard, worrisome trends have emerged, as *when democracy is reduced to a purely procedural matter, or when it is thought that the will of the majority is sufficient of itself to determine the moral acceptability of a law*. In reality "the value of democracy stands or falls with the values which it embodies and promotes...The basis of these values cannot be provisional and changeable "majority" opinions, but only the acknowledgment of an objective moral law which, as the "natural law" written in the human heart, is the obligatory point of reference for civil law itself."

4.1.2. Every day you are committed to proclaiming, defending and spreading the truth. Often this involves truths concerning the most diverse aspects of the cosmos and of history. The subject material will not always touch directly on the problem of the ultimate meaning of life and the relationship with God, as in the areas of philosophy and theology. However, this problem abides as the larger context of every thought. Even in research on areas of life which seem quite far from faith there is a hidden desire for truth and meaning which goes beyond the particular and the contingent.

4.2. Importance of philosophy ->religion (vs. aesthetics)

4.2.1. My Plato-studies (to be linked to <http://www.informatik.umu.se/~kivanov>), cf.

4.2.1.1. Roochnik, D. (1990). *The tragedy of reason: Toward a Platonic conception of logos*. New York and London: Routledge

4.2.1.2. Roochnik, D. (1996). *Of art and wisdom: Plato's understanding of techne*. University Park, Penn.: Pennsylvania State Univ. Press

4.2.2. Encyclicals

4.2.2.1. "Veritatis Splendor" (The splendor of truth) (1993):

http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jp-ii_enc_06081993_veritatis-splendor_en.html

4.2.2.2. "Fides et Ratio" (Faith and Reason) (1998):

http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jp-ii_enc_15101998_fides-et-ratio_en.html

4.2.3. And philosophy

4.2.3.1. <http://www.rosmini-in-english.org/Weblife/Lifeconts.htm>

4.2.4. And technology

Buland, T., & Dahl, T. (2000). Technological visions for social change: Information technology, telework, and the integration of the disabled persons. In *Proc. of ISTAS 2000, IEEE Int. Symposium on Technology and Society, 6-8 September 2000, Rome, Italy* (pp. 263-268). New York: IEEE Institute of Electrical and Electronic Engineers' Society for Social Implications of Technology SSIT. (Authors at SINTEF IFIM, N-7465 Trondheim, Norway.)

4.2.4.1. Noble, D. F. (1998). *The religion of technology. The divinity of man and the spirit of invention*. New York: Knopf. Cf. with Noble's engagement in the issue of IT-supported distance education at <http://chronicle.com/colloquylive/>, (and Langdon Winner's at <http://www.rpi.edu/~winner/lwapm.html>.)

4.2.4.2. Mitcham, C., & Grote, J. (Ed.) (1984). *Theology and technology: Essays in Christian analysis and exegesis*. Lanham: University Press of America. (Esp. pp. 3-42, 53-119, 193-225. Bibliography of 478 entries.)

4.2.4.3. Stivers, R. (1999). *Technology as magic: The triumph of the irrational*. New York: Continuum. (ISBN 0-8264-1211-4.)

4.2.5. And (natural) science

4.2.5.1. Center for Theology and Natural Science, Berkeley, <http://www.ctns.org/>

4.2.6. And IT for VR, visualization for virtual worlds, and communities

4.2.6.1. Cf. Michael Heim's seminar at our department 001116, and his answer to the issue of financing research and to "what are you trying to do?" vs. art and religion. Refer to <http://www.informatik.umu.se/seminarier/2000/Sem.Heim.001116.html>, and <http://www.mheim.com/cyberforum>, <http://www.design.ucla.edu/eda/eda.html>

4.3. "Quality of growth" and "Productivity" debates: relevance for poverty and development

4.3.1. http://www.worldbank.org/devforum/forum/qog_qog.html

4.3.2. <http://www.worldbank.org/poverty/wdrpoverty/>

4.3.3. <http://www.worldbank.org/wbi/governance/>

4.3.4. <http://www.globkom.net/>

4.3.5. Brynjolfson, E. (1993). The productivity paradox of information technology. *Communications of the ACM*, 36(12), 67-77

4.3.6. Anonymous. (1999). The new economy: Work in progress. On the surface, America's economy is changing dramatically, that much is plain. But just how deep the changes go, and what they imply for the country's growth in the long term, remains an open question. *The Economist*, (July 24th), 19-21. (See also the editorial in the same issue: "How real is the new economy?" pp.15-16.) Registered readers can also retrieve the article on the new economy assigned to the date 23 September 2000, http://www.economist.com/editorial/freeforall/20000923/index_survey.html

4.4. Internationalism vs. provincialism in "peer review"

4.4.1. cf. Van Wyk in *Systems Practice and Action Research*, 1998, vol. 11, No. 3

4.5. Local Swedish debates

4.5.1. Opus Dei, or Caritas,

4.5.1.1. cf. Werner, Y. M. (2000). Hotet från Rom. *Dagens Nyheter*, (23 augusti), B5

4.5.2. IT and aesthetics:

4.5.2.1. Cf. for instance "the right feeling", and "flow", and

4.5.2.2. Ratzinger, J. (1996). Samvete och sanning [Conscience and truth]. *Signum*, (4 & 5). (Swedish trans. by Yvonne Werner, of an essay presented as a lecture at the American Bishops' Conference on moral theological questions in 1991. In "Wahrheit, Werte, Macht. Prüfsteine der pluralistischen Gesellschaft". Herder 1995, pp. 29-62. My own approach to the aesthetical-design issue is at <http://www.informatik.umu.se/~kivanov/chinese.html>.)

4.6. Disciplinary IT, theoretical IT and system-debates

4.6.1. For instance on Actor Network Theory, or Weicks organizational social psychology, or philosophy in the flesh in VR, or Heidegger approach to the issue of "systems" and "interpretive

systemology" <http://www.ing.ula.ve/~sisint/>, and in section 4 of the coming update of <http://www.informatik.umu.se/~kivanov/PerspSem2000.html>.

4.7. References

Obtained directly or indirectly through the conference(s) (besides those included above such as encyclicals, and besides personal contacts). The listing does not imply that all items are recommended.

4.7.1. Reference source for papers about truth vs. (postmodern) relativism, cf.

<http://home1.swipnet.se/~w-17026/network/sanning.html>, and <http://www.leaderu.com/truth/>

4.7.2. Engineering ethics: Continuing and emerging issues. *IEEE Technology and Society Magazine* - *Special Issue*, (September 2001)

4.7.3. Technology and the social sciences. *Bull. of Science, Technology & Society*, (Special issue, 2000)

4.7.4. Capaldi, N. (2000). Catholic metaphysics in the wake of the collapse of the enlightenment project. In *Proc. of the Rome Metaphysics Forum 2000*. Challenge of "interpretive systemology" URL: <http://www.onelist.com/community/RomeMetaphysicsRorum>, and see also <http://www.arsap.net/metafisica>

4.7.5. Capaldi, N. (1995). Scientism, deconstruction, and nihilism. *Argumentation*, 9, 563-575. (Cf. <http://www.onelist.com/community/RomeMetaphysicsForum>.)

4.7.6. Casetta, G. (Ed.) (1987). *Origini e sviluppi dell'analogia: Da Parmenide a S. Tommaso* [*Origins and development of analogy: From Parmenides to St. Thomas*]. Roma: Edizioni Vallombrosa, Via S. Prassede 9/A. (Distrib. by Abbazia di Vallombrosa, I-50060 Vallombrosa (Firenze), tel 055-862029.)

4.7.7. Cleary, D. (2000). *Antonio Rosmini: Introduction to his life and teaching*. Durham, U.K.: Rosmini House. (ISBN 0 951 3211 61, <http://www.rosmini-in-english.org/Weblife/Lifeconts.htm>.)

4.7.8. de Raadt, J. D. R. (1997). Faith and the normative foundation of systems science. *Systems Practice*, 10(1), 13-35

4.7.9. Decker, M., Grin, J., Grunwald, A., Mambrey, P., Reuzel, R., Tepper, A., & Wilt, G. J. v. d. (2000?). *Vision assessment: Shaping technology in 21st century society: Towards a repertoire for technology assessment*. Berlin: Springer

4.7.10. Herkert, J. R. (2000). *Social, ethical, and policy implications of engineering*. New York: IEEE. (ISBN 0-7803-4712-9, IEEE Order No. PP5397-QZO, at customer-service@ieee.org, <http://shop.ieee.org/store>.)

4.7.11. Johnson, K. E. (1997). *John Hick's pluralistic hypothesis and the problem of conflicting truth-claims*: <http://www.leaderu.com/wri/articles/hick.html>, accessed 20 October 2000

4.7.12. Rosmini, A. (?). *The origins of thought*. Durham, UK. (ISBN 0 951 3211 53, <http://www.rosmini-in-english.org/Weblife/Lifeconts.htm>.)

4.7.13. Scruggs, S. (1996). *Truth or tolerance?*: <http://www.leaderu.com/orgs/probe/docs/truthtol.html>, accessed 26 October 2000

4.7.14. Seifert, J. (1987). *Back to the things in themselves*. New York: Routledge & Kegan Paul. (2nd electronic edition 1997 available at http://www.iap.li/research/Back_to_Things_Themeselves/body_back_to_things_themeselves.html, accessed 26 Oct 2000.)

4.7.15. Seifert, J. (1997). *From relativism and skepticism to truth and certainty*: <http://www.leaderu.com/truth/1truth14.html>, accessed 26 October 2000

4.7.16. Turner, M. (1996). *The literary mind: The origins of thought and language* . New York: Oxford University Press.

4.7.17. Van Wyk, G. C. B. (1998). Publish or perish: A system and a mess. *Systems Practice and Action Research*, 11(3), 245-257

FINAL NOTE:

Seminar, German, from Latin *seminarium* seminary, from *semen*, seed, a group of advanced students studying a subject under a professor, each doing some original research, and all exchanging results by informal lectures, reports, and discussions. **Seminary**, an environment in which something originates and from which it is propagated.