
About the Authors

Michalis Assimakopoulos

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Assistant Professor at the Department of Humanities, National Technical University Athens. Civil Engineering Diploma from National Technical University Athens 1970. Ph.D. in Applied Mathematics and Theoretical Physics, Liverpool University 1975. Mathematics Curator at the NTUA 1976. Unionist and political activities. Visiting Fellow at the Institute of Philosophy, Soviet Academy of Sciences, studies in philosophy 1987–1989. Assistant Professor at NTUA 1988. Visiting Scholar at the STS program MIT, 1996. Visiting Scholar at the Department of History of Science, Harvard University, 1999.

Research interests, participation in conferences: N. Bohr. Methodological issues on the formation of quantum mechanics. History of Science, Technology and Engineering in Greece since 1830. Greek-Russian scientific relations during the 17th century. Soviet Philosophy of Science. Science and Technology in Greece during the 19th–20th centuries. On the foundations of Science and Technology Studies.

Relevant activities: reconstruction of the 19th century book collections of the NTUA; formation of the Greek scientific and technological bibliography 1830–1940; co-direction of an STS book series.

In November 2002 Michalis Assimakopoulos was Guest Lecturer at IAS-STIS in Graz.

Selected Publications

(forthcoming), with A.P. Ogurtsov and S.S. Neretina, 'Philosophy of Science in Russia during the 20th Century', in *Studies of Eastern European Thought*.

(2004), with Y. Antoniou, G. Mavroyonatonou and G. Malamis, 'Is Technology in Modern Greece a Relation of Tension?', in the CD Tensions of Europe, Conference Proceedings, Budapest, March 2004.

(2003), with Y. Antoniou, 'Notes on the Genesis of the Greek Engineer in the 19th Century. The School of Arts and the Military Academy, in

K. Chatzis and Nicolaidis (Eds.), *Science, Technology and the 19th Century State*, Athens: 91–138.

(2002), ‘The Notion of Science in I. Hacking’s Work’, postscript in the Greek edition, *I. Hacking Representing and Intervening*, Athens: 359–393 (in Greek).

(2000), with T. Tsiantoulas, ‘Mass Higher Education’, in the collective volume, *The University at the 21st Century*, Athens.

(1998), ‘Helleno-Greco Academia in 17th Century Moscow’, in the collective volume, *Scientific Thought in the Hellenic Space 17–19th Centuries*, National Research Foundation, Athens: 179–194 (in Greek).

Risto Eräsaari

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Risto Eräsaari is Professor of Social Policy at the University of Helsinki. Earlier positions: Fellow (Academy of Finland), Professor (University of Jyväskylä). Visiting Fellow at Manchester University; Queensland University of Technology, Brisbane; Institute for Advanced Studies in the Humanities, Edinburgh; Goldsmith’s College, London; University of British Columbia, Vancouver; Copenhagen Business School Library; Institute for Advanced Studies on Science, Technology and Society, Graz. His main research topics are contemporary debates of social policy, expert dilemmas, trust and community. His most recent articles or chapters in books are on ‘Concept of Security’, ‘Historical School of Economics’, ‘Perspective of Contingency’ and ‘Inclusion and the Possibility of Society’. In autumn 2003 Risto Eräsaari was Guest Lecturer at the IAS-STs.

Project Abstract

Time to Discuss What We Mean by ‘Society’

As a central problematic in my project I have been working with the concept of society and given it the title ‘Time to discuss what we mean by ‘society’’. There is no pre-existing model that furnishes us with a definition of society but our interpretations are always of a world that is already occupied by ‘societies’. A society is always already written, it is made through acts, contracts and acceptances—it is a conceptually impregnated reality. Being epistemologically objective about a society is not just a

question of definition. What we need to ask instead is the following question: what kind of information do we need to know about social conditions in order to produce an account of social conditions that will be acceptable as an account of social conditions? The efforts to conceptualize a society seem to aim at either too strong integration (etatism) or too limited a notion (the nation-state). No agency may project its own competence onto the competence of the whole of society. No pars pro toto-argumentation may be enlarged to cover society as a whole. I want to argue that an inadequate understanding of 'societies', 'citizenship' and 'social bonds' leads to simplifications and trivialities within the discussion of inclusion/exclusion, management/complexity and definition/assessment.

Todor Galev

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Academically educated in the field of Sociology at the Department of Sociology, Sofia University 'St. Kliment Ohridski', Sofia, Bulgaria; Todor Galev graduated with an MA in 2000. Since 2001 he has been working on his PhD thesis at the Technology Studies Group, Department of Sociology of Science and Education, Institute of Sociology, Bulgarian Academy of Sciences. He has work experience in the field of market research and sociological studies, database processing and statistical analysis of panel data. Academic specialization: science and technology studies, sociology of technological innovation. Spheres of interest: dual use goods and technologies (DUGT), information and communication technologies, military related technologies, the development of the electronics industry in Bulgaria. From October 2002 to June 2003 he was a Fellow at the Institute for Advanced Studies on Science, Technology and Society, Graz, where he worked on a research project, which is part of his PhD thesis.

Selected Publications

(1999), with V. Bondikov, 'Tendencies of Public Relations in Bulgaria', in *Collections of Papers 'International Conference on European Tendencies in Public Relations'*, Sofia: New Bulgarian University (in Bulgarian and English).

(1998), with A. Yaneva, B. Ponomaryov, A. Varov, A. and I. Voynov, 'Mechanisms of Diversification in Higher Education in Bulgaria: The Birth of New Majors', in *Sofia University Yearbook*, Chapter 'Sociology', Sofia: Publishing House of SU (in Bulgarian).

(1997), 'Virtualisation of the Society', in *Sofia University Yearbook*, Volume 88, Chapter 'Sociology', Sofia: SU Publishing House (in Bulgarian).

Project Abstract

Dual Use Research: Between Engineering Technology and Social Networks

The research topic of my project is 'Dual Use Goods and Technologies'—final products and process technologies with both military and civil possibilities of use. The basic hypothesis is that technology in itself is neither military, nor civil, nor both of these at once—it is 'created' as such 'artificially' in the process of its implementation through the interactions of the non-human and social actors taking part in the process. In order to achieve the main goal of the study I constructed a theoretical and methodological framework that enables me to localize and define a heterogeneous 'network' of relevant actors, in whose permanent interactions the potential and factual (realized) duality of technology is 'negotiated' and 're-negotiated'. Additionally, the framework must be sensitive to the continuous fluctuations and changes of this 'network' and its inclusiveness in other heterogeneous 'networks'.

The main project objectives were analyses of the existing theoretical approaches in the field of STS and in the field of political-economic models, concerning research and development, production and proliferation of DUGT. As an additional result of my stay in Graz, I collected empirical data about science and technology policies and national export control systems in the developed Western countries in relation to 'critical' technologies.

Ulrich Glotzbach

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Ulrich Glotzbach was born in 1966 in Simmershausen, Germany. He was a student of chemistry in Würzburg and completed studies in philosophy

and electrical engineering in Cape Town and Berlin. He holds a university diploma in electrical engineering and has worked as an engineer in research and development since he graduated from university in 1996.

In engineering, Glotzbach concentrated first on solar energy (photo-voltaics and solar thermal energy conversion). Realizing that successful eco-product development needs to start from the very centre of technological development, he shifted his professional focus to cutting-edge technologies, e.g. the application of lasers and design of electronic micro-systems. In philosophy, he completed courses on philosophy of mind, phenomenology and ontology. Later he focussed on recent theories of innovation, taking up threads in sociology of technology, history of technology and cultural anthropology. In 2000, he began working on a thesis at Witten/Herdecke University which paves a way from a culturalistic model of technology rise and shaping to clues for socially responsible product development. From October 2002 to June 2003 he was Fellow at IAS-STs in Graz.

Selected Publications

(2003), 'Vom Haifisch lernen, Die Bionik-Ausstellung im Ökopark Hartberg', *Soziale Technik* 1: 26–27.

(2002), with S. Hartmann, E.K. Wolff and E. Wurr, PCT Patent Application WO 03/029109, *Method for the production of a flexible bulk-material container and bulk-material container produced according to said method.*

(2001), with S. Hartmann and E.K. Wolff, European Patent Application EP01123507, *Process for laser beam welding of plastic parts.*

(2001), with T. Funk, V. Geneiß, H. Griese, A. Middendorf and E.K. Wolff, European Patent Application EP01108599.0, *Device for transforming a primary voltage into a secondary voltage by means of at least one switched-mode power supply.*

(2000), with E.K. Wolff, 'From Green to Market: An Eco-Integrated Wall-Pack Concept', in H. Reichl and H. Griese (Eds.), *Electronics Goes Green 2000+*, Berlin.

Project Abstract

Modelling Technology Rise and Shaping: Technological Style in Product Development

The study challenges the view that technology, as a persistent human project, is strictly fenced in by the laws of nature and that therefore

only two kinds of technology exist: successful technology evidencing the truth of the laws of nature and unsuccessful technology not properly thought through. In opposition to this view, I assume that the development of any technical artefact whatsoever is embedded in a cultural setting and will be particularly structured in the course of development by supra-individual factors, individually exemplified in everyday face-to-face communication. Perhaps the most eminent of those factors, being at the same time a cognitive factor and a pattern of behaviour at both the individual and the group level, is the individually practised but essentially collective *thought style* (L. Fleck). That basically means technological development is open to embody different technological styles, relating to an infinite variety of possible thought styles. However, my impression is that most, if not all of our contemporary technological undertakings are governed by just one pre-eminent thought style (providing false evidence for the assumption that there is only one technology possible).

In that situation, with single-style dominance making wording difficult (there is no word for *blue* if everything *is* blue), the study ventures to model culturalistically salient features of technology rise and shaping, to derive from the model eventually some clues for socially responsible engineering. The goal may be achieved by seriously taking into account life-world routines of engineering, on both the individual and the group level. The most basic conceptual segregation of humans and things has unfolded as the study's central and key phenomenon. By shifting the line between humans and things, you get all those well-known theories, from man-the-toolmaker to the lone individual lost in some big machine, to even the total dissolution of the individual in systems theory.

For improving ethical decision-making on the nitty-gritty level of everyday engineering, we need something like a blind person's cane, which realistically can neither be a technical norm nor a code of ethics. I imagine this helpful cane could be made from reflective consciousness of technological styles, accompanied by an awareness of their habitual grounds in metaphorical thinking, for instance, which always correlates with specifically patterned routine behaviour. This, then, is also a question of the existence

of behavioural alternatives at the individual level. Hence, the study is considered to finally contribute to the question whether engineers, as professionals, have a special responsibility to the public.

Don Ihde

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Don Ihde is Distinguished Professor of Philosophy and Director of the Technoscience Research Group at Stony Brook University on Long Island, New York. He is the author of thirteen original and many edited books, the most recent of which are: *Chasing Technoscience: Matrix for Materiality*, with Evan Selinger (Indiana, 2003), *Bodies in Technology* (Minnesota, 2002), and *Expanding Hermeneutics: Visualism in Science* (Northwestern, 1998). Of special interest to STS readers is his latest article, 'Has Philosophy of Technology Arrived? A State-of-the-Art Review,' in *Philosophy of Science*, 71 (January 2004), pp. 117–131.

Professor Ihde is a frequent visitor to Europe as well as to Asia and other parts of the world. His current project is a book on imaging technologies and the role they play in the production of scientific knowledge. In March 2003 Don Ihde was Guest Lecturer at IAS-STS in Graz.

Adelina Ilieva

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Adelina Ilieva holds a Master's Degree in Philosophy and Pedagogy from 'St. Kliment Ohridski' University, Sofia, Bulgaria. She has been a PhD student at the Center for Science Studies and History of Science, Bulgarian Academy of Sciences, since 2001. The topic of her dissertation work is Ethics of Modern Science, Theory and Practice. She is interested in science ethics, conduct and misconduct in science, research ethics, bioethics. From October 2002 to June 2003 she was a Fellow at the Institute for Advanced Studies on Science, Technology and Society, Graz.

Recent Publication

(2003), 'Ethical Codes in Science'; *Journal of the Bulgarian Academy of Sciences* 2: 81–87 (in Bulgarian).

Project Abstract

Ethics in Regulatory Action: Social Shaping of Biotechnological Research

In many advanced sectors today, knowledge is created in the context of application. The new mode of knowledge production /A. Gibbons et al./ entails a certain transformation of the face of research, together with a change of its environment: the locus for experiment often extends to a planetary scale. Consequently, a subtle balance is required between the interest in technological progress and that of reducing the eventual social damage. The modern regulation of technological research is but a means of reconciling the coercive interests involved. It is also viewed as a warrant for diminishing harm and risk.

The ethical constraints comprise an important part in this regulation. Clearly, the very expansion of technological research entails evolutionary enrichment of traditional values and research ethics, combining academic freedom with moral constraints: the enlarged ethical code is now related to the protection of nature and human beings. The regulatory process, on the other hand, has become more complicated by involving an enlarged set of actors who are called upon to manage an increased scale of risk, together with increased social responsibility. Those newly arisen regulatory patterns comprise the general frame of my investigative interest.

Sandra Karner

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Sandra Karner studied biology with a focus on zoology and molecular biology at the University of Graz. IFZ staff member since 2001. Her main fields of research are the health related and environmental impacts of modern biotechnology, risk assessment of genetic engineering and regulatory contexts and practice. She is also interested in issues connected to science communication focusing on biosciences. Sandra Karner is in charge of INFOgen, a public information service on modern biotechnology. In this context she organizes events, public lectures and seminars as well as continuing education for different vocational groups. She is counselling various institutions in designing such information events and finds experts for specific topics. She gives advice on teaching materials, videos,

literature, multi media CDs, overhead transparencies and on how to find information in the Internet.

Selected Publications

(2003), with A. Spök, S. Stirn and H. Gaugitsch (Eds.), *Toxikologie und Allergologie von GVO-Produkten – Teil 2B. Untersuchung von Regelungen zur Sicherheitsbewertung von gentechnisch veränderten Lebensmitteln in der EU und den USA*, Monographien Band 164B, Wien: Umweltbundesamt.

(2002), with B. Wieser, *International Summer Academy on Technology Studies: Technology and the Public*, Conference Proceedings, Graz: IFF/IFZ.

(2002), with A. Spök and H. Gaugitsch, *Evaluating Substantial Equivalence. A step towards improving the risk/safety evaluation of GMOs*, Conference Papers, Vol. 32, Vienna: Federal Environment Agency.

'Biotech News', in *Soziale Technik. Zeitschrift für sozial- und umweltverträgliche Technikgestaltung*, Interuniversitäres Forschungszentrum für Technik, Arbeit und Kultur (IFZ), Graz, periodically since 1/2002 and in: Infogen service online: www.infogen.at (updated regularly).

Courtney Everts Mykytyn

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Mykytyn completed her undergraduate degree in biological sciences at the University of Southern California in Los Angeles. In the autumn of 1998 she began working toward her Ph.D. in cultural anthropology at the University of Southern California. She focuses on medicine, aging and science and her dissertation, entitled 'Executing Aging: An Ethnography of Anti-Aging Medicine' examines the anti-aging medicine movement in the United States.

With the assistance of a Wenner Gren Foundation Dissertation Fieldwork Grant and a Center for Feminist Studies Travel Grant, Mykytyn has traveled across the United States conducting her ethnographic research. While working on her dissertation, Mykytyn teach-assists in the departments of anthropology and gerontology at USC and in humanities at Harvey Mudd College. Mykytyn was awarded an Honorable Mention by the Association for Anthropology and Gerontology in 2001 for a paper entitled 'Executing Aging Online'. Courtney Everts Mykytyn was Fellow at IAS-STIS in May and June 2003.

Selected Publications

(Forthcoming), 'Anti-Aging Medicine and the Irrelevance of Being Natural: A Patient/Practitioner Movement to Redefine Aging', *Social Science and Medicine*.

(2003), 'Technoscientific Optimism, Anti-Aging Medicine, & Engineered Negligible Senescence', presented at the Institute for Advanced Studies on Science, Technology and Society, Graz, Austria, June.

(2003), 'Making nature irrelevant: Ethnography of anti-aging medicine', *American Anthropology and Gerontology Association Newsletter* 24 (2).

(2002), 'Situating Aging as Disease', presented at the Progress in a Diverse World: The Fifth Annual GPSS Interdisciplinary Conference, University of Southern California, Los Angeles, CA, April.

(2001), 'Anti-Aging Online: The A4M and Honeyed Sheep', Presentation given at the Anthropology of Science, Technology, and Medicine Workshop at the California Institute of Technology, Los Angeles, May.

(2001), 'Executing Aging Online', Margaret Clark Award, Honorable Mention Graduate Paper, sponsored by the Association for Anthropology and Gerontology.

(2001), 'Anti-Aging Online', Presentation given at the Committee for the Anthropology of Science, Technology, and Computers Conference, USC, Los Angeles.

Project Abstract

Beginning this doctoral research in medical anthropology on anti-aging medicine in 2000, I have conducted fieldwork with anti-aging medical practitioners and researchers. This work has primarily been focused on the construction of aging and nature and how these two categories have been influential in designing the scientific and biomedical attention to aging. During the Spring of 2003, I spent two lovely months at the Institute for Advanced Studies on Science, Technology and Society in Graz, Austria. Having completed the majority of interview research prior to this fellowship, I focused my time on creating a professional genealogy of anti-aging medicine. This genealogy is meant to trace the contours of the anti-aging medicine movement as it continues to grow. Monitoring the changing definitions of aging and nature—two

highly elusive and weighty categories indeed—this genealogy is a way of tracing these categorical shifts through the anti-aging medicine movement.

Tracking individual researchers and practitioners through their institutions was the first thrust of this genealogy and it quickly became a much larger project that included other ways in which the idea of anti-aging traveled. I tracked conferences, institutions, publications, corporations, government interactions, products and services, acknowledgements made in books and articles, internet forums. Carefully identifying how these are linked and the context for these linkages, the idea of optimization or perfectibility became obvious as the fulcrum. That aging has been coupled with a natural life course no longer conferred any protection from biomedical intervention as perfecting the physiological body became the overarching goal.

Gerd Schienstock

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Gerd Schienstock habilitated in 1980 at the University of Hamburg. The title of the thesis submitted for the certificate of habilitation was 'Industrial relations: A comparison of theoretical approaches'. He started his scientific career as a researcher at the Faculty of Economics at the Technical University in Berlin. In 1974 he became Assistant Professor in Industrial Sociology at the University of Hamburg. In 1980 he became the Head of the Sociology Department of the Institute for Advanced Studies and Applied Research in Vienna (Austria). In this position, he conducted several research projects in the fields of the labour market, work values, new technologies, and work organisation. In 1987/1988 he was Visiting Professor at the University of British Columbia at Edmonton (Canada). In 1992 he received a research grant from the Japanese Society for the Promotion of Science; during his stay in Japan, he worked at the Chuo University in Tokyo.

In 1993 he became a senior researcher at the Center for Technology Assessment of Baden-Württemberg in Stuttgart. Since 1995 he has worked as Research Professor and Scientific Director of the Work Research Centre at the University of Tampere, Finland.

Gerd Schienstock has co-ordinated many research projects nationally and internationally, among which the most recent are: *Regional Innovation System. Designing for the Future* (REGIS, TSER Programme/EC/DGXII and the Academy of Finland, 1996-98); *Information Society, Work and the Generation of New Forms of Social Exclusion* (SOWING, TSER Programme/ EC/DGXII, 1998-2001); and *National Systems of Innovation and Networks in the Idea-Innovation Chain in Science-Based Industries* (TSER Programme/ EC/DGXII, 1998–2001). In 1998, he was also appointed Scientific Co-ordinator of the Research Programme on the National Innovation Systems (1998–2001) funded by Sitra, the Finnish National Fund for Research and Development, in connection with which he also co-operated with the OECD Focus Group on National Innovations Systems, particularly on Innovative Firms and Networks. He also consulted several institutions, among which are Sitra, the Finnish National Fund for Research and Development; the European Commission/DGXII; the European Centre for the Development of Vocational Training (CEDEFOP, EU), and the OECD.

In autumn 2002 he was Guest Lecturer at IAS-STS in Graz.

Selected Publications

(forthcoming), 'Sustainable Development and the Regional Dimension of the Innovation System', in K.M. Weber and J. Hemmelskamp (Eds.), *Towards Environmental Innovation Systems*, Heidelberg: Springer/Physica. (2004), with M. Kautonen and P. Koski, 'Escaping Path Dependency: The Case of Tampere, Finland', in P. Cooke, M. Heidenreich and H.-J. Braczyk (Eds.), *Regional Innovation Systems*, 2nd Edition, London: Routledge. (2004) (Ed.), *Embracing the Knowledge Economy: The Dynamic Transformation of the Finnish Innovation System*, Cheltenham, UK: Edward Elgar. (2003), 'Technological Practices and Social Exclusion Risks in Information Society—A Conceptual Framework', in G. Bechmann, B.-J. Krings and M. Rader (Eds.), *Across the Divide*, Berlin: Edition Sigma: 17–41. (2002), with T. Rissanen, 'Towards a European Network Economy?', in G. Banse, A. Grunwald and M. Rader (Eds.), *Innovations for an e-Society. Challenges for Technology Assessment*, Gesellschaft TechnikUmwelt, Neue Folge 2 Berlin: Edition Sigma: 149–174.

Project Abstract

Organizational Innovations

Over several decades innovation researchers have made major efforts aimed at understanding and measuring technical change. Disappointing experiences with ICT applications have made it obvious that to understand the impact of modern technologies on economic growth and social welfare one has to highlight the central role of organizational change in a cluster of complementary and mutually reinforcing technical and social innovations. In the paper organizational innovations are understood as a means to improve companies' capacity to deal with organizational problems such as guaranteeing high economic performance, aligning more effectively with their environment, balancing the vested interests of stakeholders and fulfilling societal demands. The paper also deals with different approaches to conceptualize organizational innovations, develops a typology of organizational innovations based on depth and breadth of change, discusses a user concept of organizational innovation and analyses the linkages between organizational, technical and cultural innovations. Finally the paper refers to the concept of national organizational trajectories and discusses the aspects of path dependency and path creation.

Olga Stoliarova

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Olga Stoliarova was born in Moscow, Russia, in 1970. In 1995 she received her M.A. at the Russian State University for Humanities (Moscow), Department of the History and Theory of Culture. From 1995 she was a postgraduate at the Department of Modern Western Philosophy at the Institute of Philosophy, Russian Academy of Sciences (Moscow) working on her PhD thesis devoted to phenomenological approaches to science and technology. In 2000 she defended the thesis and was awarded her doctoral degree (Candidate of Science). From 1999 to 2003 she was a researcher at the Department of Philosophy, Institute of Scientific Information for Social Sciences, Russian Academy of Sciences (INION), Moscow. Subsequently, her interests concentrated on philosophy and sociology of

science, postmodern approaches to science and technology, theories of science in a cultural context, STS symmetries, and concepts of hybrid reality. She also was a Lecturer at the Department of Management (Chair of Philosophy and Methodology of Science), Moscow State University, during the 2001–2002 academic year and prepared an introductory course on STS for the Department of Philosophy (the Chair of Philosophy of Science), Moscow State University.

Since 2003 she has worked as a Senior Lecturer at the Department of Philosophy, State University, Higher School of Economics (Moscow).

From October 2002 to June 2003 she was a Fellow at the Institute for Advanced Studies on Science, Technology and Society, Graz. She is now working on a project that she intends to develop into her habilitation (Doctor of Science).

Selected Publications

(2003), 'Social Constructivism: An Ontological Turn (an afterword on Bruno Latour's article)', *Bulletin of Moscow State University, Seria 7 'Philosophy'* 3: 39–51.

(2003), 'Latour, B. When Things Strike Back: A Possible Contribution of 'Science Studies' to the Social Sciences: Translation from English', *Bulletin of Moscow State University, Seria 7 'Philosophy'* 3: 20–39.

(2003), 'Postnonclassical Image of Science: "Technoscience Studies" (a review)', *Philosophy in 20th Century: Collection of Reviews, Parts 1–2*, Moscow: Institute of Scientific Information in Social Sciences of the Russian Academy of Sciences, Part 2: 41–81.

(2000), 'Cyborg Identities' (Aarhus, Denmark, October 21–22, 1999): Review of Materials of the Conference', *Referative Journal 'Social Sciences and Humanities', Seria 3 'Philosophy'*, Moscow: Institute of Scientific Information in Social Sciences of Russian Academy of Sciences, No. 2: 45–63.

(2000), 'Don Ihde's Instrumental Realism', *Journal of History of Philosophy*, Moscow: Institute of Philosophy of the Russian Academy of Sciences, No. 5: 113–138.

Project Abstract

Social Constructionism: An Ontological Turn (analysis of some trends of postmodern philosophy and sociology of science through a reading of STS 'symmetries')

I investigate 'symmetrical approaches' in STS as an example of the wider trend of postmodern thought often referred to as 'a turn towards ontology'. The philosophical implications of STS programs express a 'changing of paradigms' in the current humanities. A revision of the 'Modern project' and a search for new ways of building 'postmodern' conceptions characterize this paradigm shift. The main target for criticism is the 'subject-object' dichotomy from which modern thought developed. Current humanities try to avoid the 'dictat of subject' and to return to 'things in themselves'.

This revival of ontology is not a return to 'naive objectivism' or physical reductionism. The novelty of these strategies lies in a revision of the very idea of the object, which is given human-like characteristics: it is considered as multi-dimensional, unstable, historically developing. It brings social sciences in a close approach to natural sciences, which for their part try to include human dimensions within the structure of explanatory models.

Thus if modern disciplinary paradigms were built on the idea of purity regarding natural and human objects, then 'postmodernity' is characterized by the search for hybrid models in which one can find transitions from reflection on nature to reflection on the human being and vice versa.

The focus of my attention is upon recent results of STS, which may be considered as attempts to reject the subject oriented concepts in favor of hybrid models. It is expressed as the revision of the idea of social construction of reality from the standpoint of symmetrical approaches. Symmetries are based on relational ontology, which supposes equal participation of humans and nonhumans in the creation of scientific facts and the world. The goal of my investigation is to analyze STS symmetries as an appropriate response of social sciences to our present situation of synthesis of natural and humanitarian paradigms.

I analyze the spectrum of the constructive positions which the STS participants take in current ontological and epistemological discussions and try to trace the connection of these positions with the results of STS case (field) studies.

Ivan Tchalakov

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Ivan Tchalakov graduated in 1988 from the Institute of Sociology, Bulgarian Academy of Sciences (BAS); thesis on classical sociology of knowledge. He is working in the field of sociology of science and the economics of technical change. Between 1993–1997 he carried out an ethnographic study of the holographic laboratory (CLOSPI) at BAS. In this study he developed the notion of *heterogeneous micro-communities*, comprising a limited number of human and non-human actors in the laboratory, and which are based on the relationships of *passivity* and *responsibility* (Levinas, Merleau-Ponty). Since the mid-1990s Ivan Tchalakov has also extensively studied the transformation of the research and innovation systems in the post-socialist countries. He was Fellow at the Institute for Advanced Studies on Science, Technology and Society from February to June 2003.

Selected Publications

(2004), 'The Object and the Other in Holographic Research—Approaching Passivity and Responsibility of Human Actors', *Science, Technology & Human Values* 29 (1).

(2003), 'Joseph Schumpeter Rethought: The Classic Ideas on the Innovations in No-exchange Economy in the Light of Some Recent Studies of the Communist Economy', *Teorie Vědy (Theory of Science)* Vol. XII/XXV/2003, No. 3, Prague.
Tchalakov I., (2002), 'Towards a Neoschumpeterian Model of Post-Socialist Economic Transition', *Sociological Problems*, Special Issue 2002, LIK Publishing House, Sofia: 115–128.

(2001), 'The Bulgarian Research System—Ten Years Later', in D. Cox, P. Gummet and K. Barker (Eds.), *Government Laboratories: Transition and Transformation*, PREST, University of Manchester, NATO Science Series 4: Vol 34.

(2001), 'Innovating in Bulgaria: Two Cases in the Life of a Laboratory Before and After 1989', *Research Policy* 30 (3), February: 391–402.

(1999), 'Dilemmata der wissenschaftlichen und technologischen Entwicklung Bulgariens im Zeitraum 1950–1980', in Hans Leo Kramer (Ed.), *Transformation in Bulgarien*, Universität Saarbrücken: 51–78.

Project Abstract

The Sites where the Future Takes Shape: Comparative Analysis of the Emergence and Stabilisation of Heterogeneous Micro-Communities in the Scientific Laboratories and Large Technical Systems

The research project was devoted to the development of the notion of *heterogeneous micro-community (coupling)* and methods of its empirical study elaborated earlier within the framework of Actor-Network Theory (Tchalakov 1996, 2004). The research work at IAS-STS, Graz, was carried out along two lines:

- (1) Theoretical analysis of the existing approaches in framing the relationships between human agents, natural entities and (technical) artefacts, focusing on the idea of fundamental asymmetry between human and non-human actors, yet on a different (non-Cartesian) basis. It questioned the dominant theory of human action, which reduced it to causal action. Aristotle calls this type of action 'movements' which 'have a limit', and which are directed not to the goal, but to what leads in the direction of this goal. It is this specific reduction that facilitates the substitution of human action with 'translation' as the common designation to the activities of both human and non-human actors. In the search for an alternative approach, Aristotle's 'second notion' of human action was explored—as life-action, as the reality of the essential forces, developed later by orthodox Christian tradition (hesychasm) and Heidegger.
- (2) Comparative analysis of the 'ethnographic' empirical data collected during my field research at two optoelectronic research laboratories in Sofia, Bulgaria and Hagen, Germany. The analysis was focused on 'ethnographic methods' for the treatment of visual data as complimentary to the semiotic analysis of scientific and technical objects, as developed at STS (Latour 1992; Heath and Hindmarsh 1997; Collins and Kisch 1999).

The research carried out at IAS-STS resulted in two research papers—one to be published in this IAS-STS Year Book 2004 and one under preparation (first draft presented in February 2004 at IAS-STS Conference in Graz). Also, a 50 minute ethnographic film was produced, presenting the research work at the Applied Optics Research Unit at the University of Hagen, Germany.