Twenty years after the proclamation of the ‚Age of the Brain' the we have arrived at an auspicious moment to take stock of its successes and failures, of promises kept and pledges dishonored. Moreover, we would also like to look ahead and speculate about the shape of the neuro sciences, say, twenty years from now.

Rather than engaging in polemic debates or mere rhetoric, we will offer a forum for open discussion about substantial issues of the neurosciences, e.g.: What has been, is, and will be the real impact of the neuro sciences on our concept of mind, on the personality of the individual as well as on our social, medical, political and legal systems? What are, and could be in the future, windfall profits for such disciplines like economics, psychology, or ethics? Will advances in the neuro sciences really lead to paradigm changes in the humanities, especially in philosophy, social history, or aesthetics?

Zwanzig Jahre nach der Ausrufung einer ‚Epoche des Gehirns' und dem scheinbar unaufhaltsamen Siegeszug der Neurowissenschaften gilt es, kritisch Bilanz zu ziehen und ihre Perspektiven zu diskutieren. Haben sich die Hoffnungen der Neurophysiologen, das Gehirn gleichsam zum Sprechen zu bringen, wirklich im gewünschten Maße erfüllt? Sind durch die Hirnforschung unsere Vorstellungen von personaler und kollektiver Identität grundlegend verändert worden und zwingt sie andere Humanwissenschaften wie Philosophie, Psychologie, Theologie, Jurisprudenz oder Ökonomie zu einem radikalen Umdenken? Und vor allem: Wo werden die Neurowissenschaften in weiteren zwanzig Jahren stehen?

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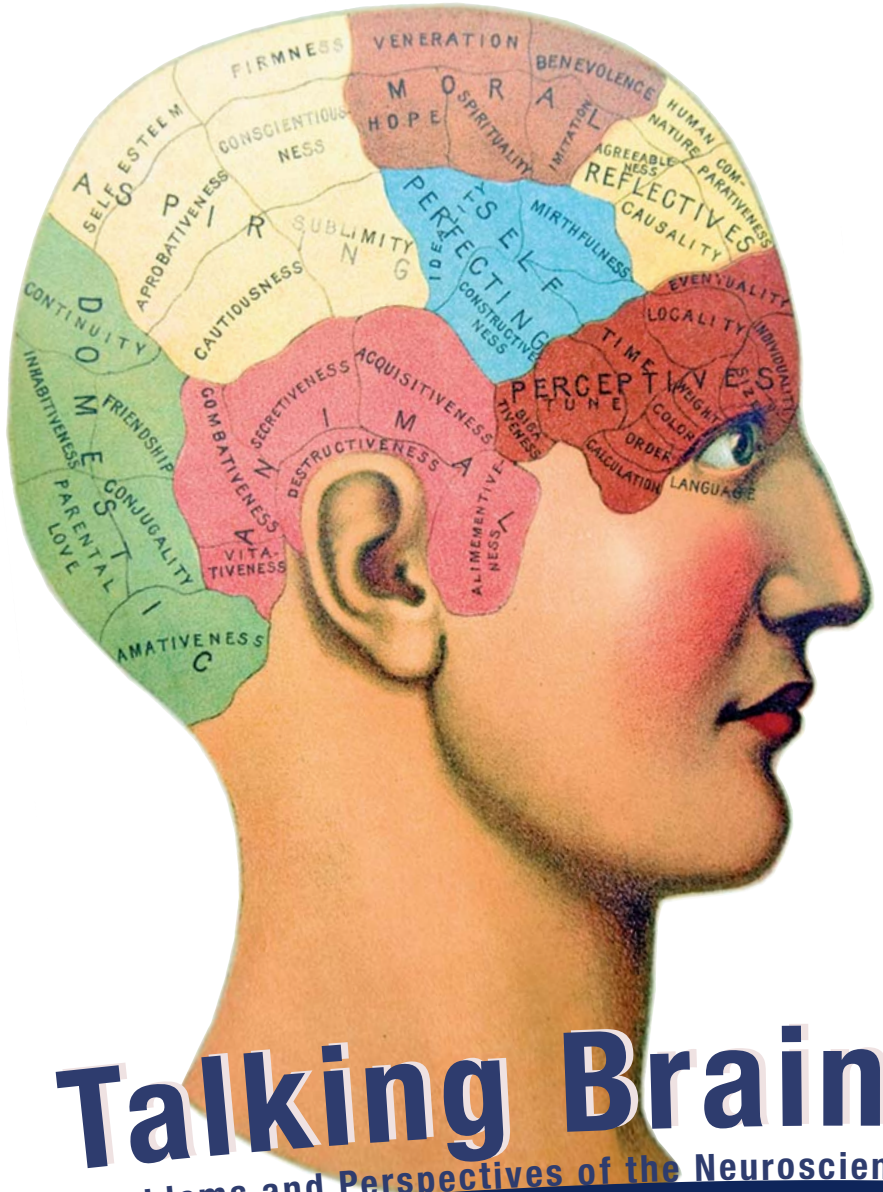

Talking Brains

Problems and Perspectives of the Neurosciences

Internationale Tagung
Freitag, 3. – Samstag, 4. Dezember 2010
Einstein Forum, Potsdam

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Talking Brains

Problems and Perspectives of the Neurosciences

International Symposium
Friday, December 3 – Saturday, December 4, 2010
Einstein Forum, Potsdam

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Cornelius Borck

Belatedness – Historiographical Reflections on Time and Readiness in the Neurosciences

When Hans Helmut Kornhuber and Lüder Deecke recorded what they labeled *Bereitschaftspotential* in the mid-1960s, they regarded this as clear evidence for the neurophysiological processes underlying voluntary action and the initiation of movement. Their findings relied on new electronic methods to retrospectively analyze stored data. A few years later, Benjamin Libet repeated their experiments in modified form, but now the data furbished his conclusion that, neurophysiologically, volition and freedom of decision making were an afterthought, created by the nervous system in addition to the action programs already initiated. Libet, though, left a small window for conscious interference, his famous vetoing function, belated for any real action but not too late for stopping ongoing preparations. With this idea, he shifted the belatedness from the side of the technical analysis to the brain, but he revived, at the same time, the old concept that interference, protraction, and inhibition qualify actions as human – in contrast to the automatic functioning of animals. Another three decades later and after further repetitions of similar experiments with more modern methods in a changed cultural setting where the neurosciences enjoyed a massively fostered position, a radical interpretation gained momentum, declaring volition a mere illusion and expurgating any freedom from the human realm by means of the experimental evidence. Have the neurosciences finally arrived at the real meaning of the data? Instead of debating once more the possible significance of Libet's experiments, the presentation focuses on the different layers of belatedness that characterize the various stages of the experiments, the time course of their repetition, their materiality as well as their belated public resonances.

Cornelius Borck is a historian of science and medicine and Director of the Institute for the History of Medicine and Science Studies of the University Lübeck, Germany. Before coming to Lübeck, he held a Canada Research Chair in Philosophy and Language of Medicine at McGill University, Montreal. Earlier appointments include the research group "Writing Life, Media Technologies, and the History of the Life Sciences 1800–1900" in the Faculty of Media at the Bauhaus University in Weimar and a Karl-Schädler-Research Fellowship at the Max Planck Institute for the History of Science in Berlin. His research topics cover mind, brain, and self in the age of visualization; the epistemology of experimentation in art, science, and media;

and sensory prostheses and human-machine relations between artistic avant-garde and techno-science. Selected publications: "Interpreting Medicine: Forms of Knowledge and Ways of Doing in Clinical Practice," in Peter K. Machamer and Gereon Wolters, ed., *Interpretation: Ways of Thinking About the Sciences and the Arts* (2010); "Through the Looking Glass: Past Futures of Brain Research," *Medicine Studies* (2009); "Recording the Brain at Work: The Visible, the Readable, and the Invisible in Electroencephalography," *Journal of the History of the Neurosciences* (2008); "Blindness, Seeing, and Envisioning Prosthesis: The Optophone between Science, Technology, and Art," in Dieter Daniels and Barbara Ulrike Schmidt, ed., *Artists as Inventors – Inventors as Artists* (2008); "Sound Work and Visionary Prosthetics: Artistic Experiments in Raoul Hausmann," *Papers of Surrealism 005* (www.surrealismcentre.ac.uk/publications/papers/ journal4/ index.htm); *Psychographien* (co-edited with Armin Schäfer; 2006); *Hirnströme: Eine Kulturgeschichte der Elektroenzephalographie* (2005); *Maß und Eigensinn: Studien im Anschluss an Georges Canguilhem* (co-edited with Volker Hess and Henning Schmidgen; 2005); *Mindful Practices: On the Neurosciences in the Twentieth Century* (special issue of *Science in Context*, co-edited with Michael Hagner; 2001).

Ray Dolan

Value and Irrationality in the Brain

Normative accounts of decision making invoke the idea that we choose in order to optimize the hedonic value, or utility, of expected outcomes. However, there are myriad examples where our behavior indicates that we readily violate the prescriptions of rational decision making. For example, when a doctor recommends options for treatment to a patient the precise manner whereby this information is presented (as a probability of an adverse outcome versus a probability of a cure) leads to dramatically different treatment uptake rates. Similarly, the value we attach to an object seems to be peculiarly bound up with whether we own this object or not, with ownership leading to inflation of value. The pervasive nature of these deviations from rationality begs the question as to their origin. I will suggest that a fundamental explanation relates to our evolutionary heritage such that how information is presented, and the very nature of this information (does it predict a likelihood of reward or punishment), elicits hard-wired responses that exert a biasing effect (and sometimes corrupting effect) on goal-directed decision making. More broadly, what this seems to tell us is that the human mind is more akin to a parliament, characterized by competing in-

terests, rather than the expression of some monolithic all knowing, and rational, chief executive.

Ray Dolan is Mary Kinross Professor of Neuropsychiatry at University College London and Director of its Wellcome Trust Centre for Neuroimaging. His research is concerned with the neurobiological characterization of human emotion and how it interacts with other components of cognition, particularly attention, memory and decision making. An emphasis in his recent work has been to link brain activity to theoretical models of decision making, particularly models derived from reinforcement learning theory. He is the author of 400 original papers and is ranked as one of the most cited scientists in the field of neuroscience and behavior. He is the recipient of numerous awards and prizes, including an Alexander von Humboldt International Research Award for Outstanding Scholars (2004), the Kenneth Craik Research Award (2006), the Minerva Foundation Golden Brain Award (2006), and the prestigious International Max Planck Research Award (2007). In 2010 he was elected a Fellow of the Royal Society. Selected publications: *Modelling Event-related Skin Conductance Responses* (with D. R. Bach, G. Flandin, K. J. Friston; 2010); *Effects of Category-specific Costs on Neural Systems for Perceptual Decision Making* (with S. M. Fleming, L. Whiteley, O. J. Hulme, M. Sahani; 2010); *Computational and Dynamic Models in Neuroimaging* (with K. J. Friston; 2010).

Kai Fehse

Beyond the Neuro-Buzz – Problems and Perspectives of Consumer Neuroscience

The concept of neuromarketing has electrified the media, and consumer neuroscientists are now in search of a longed-for and feared "buy button." The location of said button appears to be somewhere in the limbic system of all places, a part of the brain whose mysterious reputation has been debunked by modern neurosciences. Serious consumer neuroscience has a problem less with purchase ethics than with marketing mystique. Traditional neuroscience, by contrast, takes a far more sobering approach to the investigation of brands and advertising communication, with its primary task being to evaluate the findings of cognitive neurosciences. One result of its work is the replacement of classic conditioning with Damasio's "somatic markers" – a model that, when applied to advertising, shares little in common with the paradigm of the secret seducer.

Kai Fehse studied politics, economics, and the psychology of market and advertising. After completing a post-graduate program in cognitive neuroscience at Columbia University, he went on to write his dissertation, on neuroscience, at the Ludwig Maximilian University of Munich. After working as a freelance writer and consultant numerous advertising agencies (e.g. for Fehse & Partner, Springer & Jacoby, Media Markt Marketing, For Sale Group) ,he received a position as research fellow at the university's Institute for Medical Psychology. He also directs the Institute for Cognition and Communication in Munich. He is the author of *Neurokommunikation. Ein Modell zur Wirkweise von Werbung im Lichte neuester Erkenntnisse der Hirnforschung* (2009).

Michael Hagner

Concluding Remarks

Michael Hagner studied medicine and philosophy at the Freie Universität Berlin (1980–1986). After earning his M.D. in 1986, he worked as a neurophysiologist at the FU Berlin. In 1989, he was a visiting scholar at the Wellcome Institute for the History of Medicine in London. He worked at the Institute for the History of Medicine and Science in Lübeck (1989–1991) and at the Institute for the History of Medicine in Göttingen (1991–1995), where he obtained his habilitation at the Medical Faculty (1994). In 1995 he received a Heisenberg grant from the German Research Foundation and moved to the Max Planck Institute for the History of Science in Berlin. Since 1997 he has been senior scientist at the Max Planck Institute. Hagner has been visiting professor at the universities of Salzburg, Tel Aviv, Frankfurt am Main, and Cologne. He was a fellow at the Collegium Helveticum (2001), at the Zentrum für Literatur- und Kulturforschung in Berlin (2006 and 2007), and at the Maison des Sciences de L'Homme in Paris (2008). In 2000 he was awarded the Berlin Brandenburg Academy of Science Prize; in 2008 he received the Sigmund Freud Prize for Scientific Prose by the German Academy for Language and Poetry. Selected publications: *Der Hauslehrer: Die Geschichte eines Kriminalfalls. Erziehung, Sexualität und Medien um 1900* (2010); *Homo Cerebralis: Der Wandel vom Seelenorgan zum Gehirn* (2008); *Geniale Gehirne: Zur Geschichte der Elitegehirnforschung* (2007); *Der Geist bei der Arbeit: Historische Untersuchungen zur Hirnforschung* (2006).

Ewa Hess and Hennric Jokeit

Neurokapitalismus

There is good reason to assert the existence, or at least the emergence, of a new type of capitalism: neurocapitalism. After all, the capitalist economy, as the foundation of modern liberal societies, has shown itself to be not only exceptionally adaptable and crisis-resistant; in every phase of its dominance, it has been capable of producing the scientific and technological wherewithal to analyze and mitigate the self-generated "malfunctioning" to which its constituent subjects are prone. In doing so – and this too is one of capitalism's algorithms – it involves them in the inexorably effective cycle of supply and demand. In globalized capitalism the mental resources of attention, emotion, and memory are being overloaded by the general acceleration of social processes. This makes mental resources scarce, thus favoring their capitalist exploitation as a commodity. Today, the neurosciences enjoy a similar prestige as psychoanalysis in the twentieth century. Despite the immense costs for healthcare systems, the fear of depression, dementia, and attention deficit disorder legitimizes the boom in neuropsychotropic drugs. In a performance-driven society that confronts the self with its own shortcomings, neuroscience serves an expanding market.
For the individual, this development has meant a change in self-awareness and also in the most prevalent psychopathological symptoms, which are increasingly manifesting themselves as bipolar affective attention deficit disorder.

Ewa Hess is culture writer and editor at the Swiss *SonntagsZeitung*, Zurich and teaches at the Zurich University of Fine Arts. In addition to her activities as a newspaper journalist she devotes her research to the subject of neurocapitalism. Together with the Zurich clinical neuropsychologist Hennric Jokeit she publishes scientific studies on the links of capitalistic interests and laws with the neurosciences and neuro-enhancement. She co-edited *Chaos, Wahnsinn: Permutationen der zeitgenössischen Kunst* (with Wolfgang Denk, Johannes Gachnang, and Konrad Tobler; 1996).

Hennric Jokeit studied psychology at the Humboldt University of Berlin, earning his Ph.D. in 1991. In 1990, he was a guest researcher at the Institute of Medical Psychology of the Ludwig Maximilians University Munich. From 1991–1992 he worked there as a member of the research staff. In 1993 he won a DFG postdoctoral educational grant for a research project with Scott Makeig at the Naval Health Research Center, San Diego, USA. From

1994–2001 he was senior neuropsychologist at the Bethel Epilepsy Surgery Program in Bielefeld, Germany. In 2000 he completed his habilitation in physiological psychology at the University of Bielefeld, and in 2002 he completed his habilitation in neuropsychology at the University of Zurich. Since 2001 he has been senior neuropsychologist at the Swiss Epilepsy Centre in Zurich. Since 2002 he has been head of the institute of neuropsychological diagnostics and functional imaging (INDB) at the Swiss Epilepsy Centre and research group leader of the Neuroscience Center Zurich. He is also a professor of neuropsychology at the University of Zurich. His current research topics include: mesial temporal lobe epilepsy, social cognition and epilepsy, and cognitive side-effects of antiepileptic drugs. Selected publications: "Epileptic Activity Influences the Speech Organization in Medial Temporal Lobe Epilepsy" (with J. Janszky, D. Heinemann, R. Schulz, F. G. Woermann, A. Ebner), *Brain* 126 (Pt 9; 2003); "Aging Limits Plasticity of Episodic Memory Functions in Response to Left Temporal Lobe Damage in Patients with Epilepsy" (with Hans J. Markowitsch), *Adv Neurol.* 81 (1999); *Long-term Effects of Refractory Temporal Lobe Epilepsy on Cognitive Abilities: A Cross Sectional Study* (with A. Ebner; 1999).

Jürgen Kaube

Mein Hirn kenne ich nur vom Hörensagen – Neurologie und Sozialwissenschaften

The newest data about our brain has left very different impressions on the academic disciplines. Some fields are indifferent, while others are enthusiastic, seeing much promise in neurological discovery. My talk will inquire into the source of this difference and ask whether criteria exist to determine whether and to what extent brain research will be fruitful for the social sciences.

Jürgen Kaube studied sociology, economics, philosophy, and art history at the Freie Universität Berlin. In 1992 he began work as a regular contributor to the arts and culture section of the *Frankfurter Allgemeine Zeitung*. In 1999 he became the paper's Berlin correspondent, and in 2000 he joined the editorial staff in Frankfurt, where he has since worked as editor for the science and education sections. In August 2008 his duties expanded when he was appointed executive editor for the humanities. He also supervises the section "Erkenntnis und Interesse" for the *Frankfurter Allgemeine Sonntagszeitung*. Selected publications: *Die Illusion der Exzellenz: Lebenslügen der Wissenschaftspolitik* (2009) and *Otto Normalabweichler: Der Aufstieg der Minderheiten* (2007).

11 am — **Susan Neiman/Matthias Kross** Einstein Forum, Potsdam

Welcome

11.15 – 12 pm — **Raymond Tallis** Writer, Philosopher, and Emeritus Professor of Geriatric Medicine, Manchester

Why Neuroscience Will Never Explain Consciousness

12 – 12.45 pm — **Nikolas Rose** Martin White Professor of Sociology; Director, BIOS Centre, London School of Economics

Governing Brains – Risky and at Risk

Lunch Break

2.45 – 3.30 pm — **Ewa Hess** Culture Writer and Editor, *SonntagsZeitung,* Zurich; Visiting Scholar, Zurich University of the Arts

Hennric Jokeit Professor of Neuropsychology, Swiss Epilepsy Centre, University of Zurich, Neuroscience Center Zurich

Neurokapitalismus

3.30 – 4.15 pm — **Kai Fehse** Managing Director, Institute for Cognition and Communication, Munich

Beyond the Neuro-Buzz – Problems and Perspectives of Consumer Neuroscience

Coffee Break

4.45 – 5.30 pm — **Angelica Staniloiu** Research Fellow, Department of Physiological Psychology, University of Bielefeld

When Talking Ends – Psychogenic Amnesia and the Brain

5.30 – 6.15 pm — **Fernando Vidal** Research Scholar, Max Planck Institute for the History of Science, Berlin

Neuroesthetics, or How to Get Rid of Art

Wine Reception

7 pm — **Herwig Kopp** Media Artist, Vienna/Berlin

Opening of the Exhibition **Mind – The Gap**

Introductory Remarks: Sandra Manhartseder Berlin

10.30 – 11.15 am **Ray Dolan** Mary Kinross Professor of Neuropsychiatry; Director, Wellcome Trust Centre for Neuroimaging, University College London

Value and Irrationality in the Brain

Coffee Break

11.30 – 12.15 pm **Kenan Malik** Writer and Jounalist, London

Science, Morality, and the Euthyphro Dilemma

12.15 – 1 pm **Cornelius Borck** Professor of History, Theory, and Ethics of Medicine and the Sciences; Director, Institute for the History of Medicine and Science Studies, University Lübeck

Belatedness – Historiographical Reflections on Time and Readiness in the Neurosciences

Lunch Break

3 – 3.45 pm **Jürgen Kaube** Editor, *Frankfurter Allgemeine Zeitung,* Frankfurt a.M.

Mein Hirn kenne ich nur vom Hörensagen – Neurologie und Sozialwissenschaften

Coffee Break

4 – 4.45 pm **Laurence J. Kirmayer** James McGill Professor of Psychiatry; Director, Division of Social and Transcultural Psychiatry, McGill University, Montreal

Cultural Neuroscience and the Politics of Alterity

4.45 pm **Michael Hagner** Chair for Science Studies, ETH Zurich

Concluding Remarks

Program may be subject to change.

Laurence J. Kirmayer

Cultural Neuroscience and the Politics of Alterity

Given the ongoing biologization of psychiatry, the question of how culture shapes psychopathology can be (partly) reframed in terms of influences of culture on the brain, the central concern of the emerging field of cultural neuroscience. This presentation will explore some links between three meanings of the cultural construction of the brain: (1) the brain as an object of culture: the ways in which culturally grounded metaphors construct popular and scientific understandings of the brain; (2) the brain as the organ of culture: the ways in which cultural lifeways, knowledge, and practice are acquired through neurodevelopment, learning, and plasticity; and (3) the brain as an outcome of culture: the ways in which brains differ across cultures by virtue of developmental histories and social contexts that emphasize specific modes of functioning. Despite the appeal of social and cultural neuroscience, there are reasons for concern because locating psychopathology and cultural difference in the brain encourages views of human affliction that tend to ignore the social origins of suffering and healing. Taking culture seriously demands a psychiatry that understands the brain as part of larger social, cultural, and political systems. This talk will discuss the implications for addressing cultural diversity in psychiatric theory and practice.

Laurence J. Kirmayer is James McGill Professor and Director, Division of Social and Transcultural Psychiatry in the Department of Psychiatry at McGill University in Montreal. He also directs the Culture & Mental Health Research Unit at the Department of Psychiatry of the Sir Mortimer B. Davis – Jewish General Hospital in Montreal. From 1987–1993 he was a psychiatric consultant for the Inuit communities of Nunavik on the Hudson coast. He founded and co-directs the National Network for Aboriginal Mental Health Research and is a member of the Advisory Board of the Institute for Aboriginal Peoples Health. Currently, he is the principal investigator on a cross-national study of resilience among indigenous peoples in Canada and New Zealand. His past research has focused on the development and evaluation of a cultural consultation service in mental health, on cultural concepts of mental health and illness in Inuit communities, and on risk and protective factors for suicide among Inuit youth in Nunavik (Northern Québec). Selected publications: *Understanding Trauma: Integrating Biological, Clinical and Cultural Perspectives* (2007); *Healing Traditions: The Mental Health of Aboriginal Peoples in Canada* (2008). He is editor in chief of *Transcultural Psychiatry*, a quarterly scientific journal.

Kenan Malik

Science, Morality, and the Euthyphro Dilemma

There is a growing body of literature that suggests that the best way of understanding morality is through scientific studies of the brain. These range from weaker claims that neuroscience can help establish why humans seem to possess certain moral intuitions to much stronger claims that only through the scientific studies of brain and behavior it will be possible to establish rational moral codes. This paper explores both the weak and the strong versions of the argument. Proponents suggest that by rooting morality in science it will be possible to dispense with religion and God-derived morality. I show that strong versions of the argument are, just like religion, confronted by the Euthyphro Dilemma: either morality is an arbitrary set of rules or it requires an independent gauge of right and wrong.

Kenan Malik is a writer, lecturer, and broadcaster. After studying neurobiology (at the University of Sussex) and history and philosophy of science (at Imperial College, London), he worked as a research psychologist at Sussex University's Centre for Research into Perception and Cognition. For the past 15 years he has combined academic research with popular writing and broadcasting. Academically, his main areas of interest are the history of ideas, the history and philosophy of science, the history and philosophy of religion, theories of human nature, political philosophy, ethics, and the history and sociology of race and immigration. His books include *From Fatwa to Jihad* (2009; shortlisted for the 2010 George Orwell Prize); *Strange Fruit: Why Both Sides are Wrong in the Race Debate* (nominated for the 2009 Royal Society Science Book Prize); *Man, Beast and Zombie: What Science Can And Cannot Tell Us About Human Nature* (2000), and *The Meaning of Race* (1996). His next book, on the history of moral thought, will be published in 2012. He is a panelist on BBC Radio 4's *The Moral Maze* and a writer and presenter of *Analysis*, Radio 4's flagship current affairs program. He has made a number of radio and TV documentaries on scientific, moral, and political issues and writes for a variety of publications including the *Guardian, Times, Financial Times, Bergens Tidende, Göteborgs-Posten, The Australian, Prospect, New Statesman, Literary Review*, and *Nature*.

Nikolas Rose

Governing Brains – Risky and at Risk

In this talk I will consider the ways in which the brain, in particular the developing brain of the child, has become a new target of attention caught up in strategies of risk, precaution, preclusion, and prevention. On the one hand, a new way is emerging of conceptualizing the relations between anomalies in brain structure and function and aggressive, impulsive, and anti-social conduct – risky persons on account of risky brains. On the other hand, the brain, in particular the developing brain of the child, is increasingly seen as the intermediary between forms of child rearing and problematic conduct of adolescents and adults – persons at risk on account of their brains. This dynamic – risky persons and persons at risk – is not new, but as the brain has come to figure as an intermediary, new strategies are being developed for prediction and prevention, and old strategies are being reframed in neurobiological terms. This paper will try and sketch out these new strategies and relate them to new modalities for governing persons in a neurobiological age.

Nikolas Rose is the James Martin White Professor of Sociology and the Director of the London School of Economics' BIOS Centre for the Study of Bioscience, Biomedicine, Biotechnology and Society, founded in 2003. He joined LSE in 2002, and from 2002–2006 he was convenor of the Department of Sociology. He was previously Professor of Sociology at Goldsmiths College, where he was head of the Department of Sociology, pro-warden for Research, head of the Goldsmiths Centre for Urban and Community Research, and director of a major evaluation of urban regeneration in South East London. He was originally trained as a biologist before switching to psychology and then to sociology. In 1989 he founded the History of the Present Research Network, an international network of researchers whose work was influenced by the writings of Michel Foucault. Together with Paul Rabinow (University of California, Berkeley), he recently edited the fourth volume of *Michel Foucault's Essential Works*. From 1996–2004 he was managing editor of *Economy and Society*, one of Britain's leading scholarly interdisciplinary journals of social sciences. He edits a Cambridge University Press book series on Society and the Life Sciences (with Paul Rabinow) and is co-editor (with Anne Harrington of Harvard University) of *BioSocieties*, an interdisciplinary journal for social studies of neuroscience, genomics, and the life sciences published for the LSE since 2006. His current research concerns biological and genetic psychiatry and behavioral neuroscience

along with its social, ethical, cultural, and legal implications. He is also a current recipient of a three-year Professorial Research Fellowship of the Economic & Social Research Council. Selected publications: *The Psychological Complex: Psychology, Politics and Society in England, 1869–1939* (1984); *Governing the Soul: The Shaping of the Private Self* (1999); *Inventing Our Selves: Psychology, Power and Personhood* (1996), *Powers of Freedom: Reframing Political Thought* (1999); *The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century* (2006). His work has been translated into Swedish, Finnish, Danish, German, Russian, Chinese, Japanese, Romanian, Portuguese, and Spanish.

Angelica Staniloiu

When Talking Ends – Psychogenic Amnesia and the Brain

For many years "dissociated" from neuroscientific arena, dissociative (psychogenic) amnesia – a condition usually characterized by severe retrograde memory impairment in the absence of brain damage as detected by conventional structural imaging techniques – has recently received increased attention in neuroscientific and interdisciplinary talks. Across various cultures, dissociative amnesia is nowadays recognized to occur in relationship to psychological trauma or stress. Dissociative amnesia can lead to significant and at times chronic impairments of the autonoetic consciousness, self, social functioning, and mental time travel, trapping a potentially linguistically sophisticated person in a so-called noetic existence. The exact mechanisms through which psychological stress affects mnemonic processing in dissociative amnesia are not fully elucidated, but studies emphasize the role of gene-environment interplays during windows of vulnerability in mediating the impact of stressful events on brain structures, which are crucial for memory processing. We and other research groups have investigated patients with dissociative (psychogenic) amnesia by extensive neuropsychological testing as well as functional and occasionally newer structural brain imaging techniques. In a relatively large sample of patients with this condition we evidenced hypometabolism during resting state in the right temporo-frontal region, with a decrease in the infero-lateral prefrontal cortex. In our opinion, this finding reflects the stress-mediated impairment of the episodic-autobiographical memory retrieval. It is congruent with our idea that dissociative (psychogenic) amnesia results from a stress-mediated disruption of the normal "talking" (connectivity) between brain structures of the memory network, in particular due to a desynchronization during retrieval between processing of affect-laden events (assumed to

preferentially engage the right hemisphere) and fact-processing (assumed to engage the left hemisphere).

Angelica Staniloiu obtained her medical degree in 1992 from the University of Medicine and Pharmacy Carol Davila, Bucharest. After receiving her training in psychiatry at Boston University Medical Center and at the University of Toronto's psychiatric residency program, she completed a clinical fellowship in psychopharmacology and cognitive-behavioral therapy in mood disorders at the University of Toronto (2002–2003). She is board certified in psychiatry by the Royal College for Physicians and Surgeons of Canada and the American Board for Psychiatry and Neurology. Between 2003 and 2008 she was a staff psychiatrist in the Mood and Anxiety Disorders Clinic at the Centre for Addiction and Mental Health, Toronto and a lecturer in the Department of Psychiatry at the University of Toronto. Since November 2008, she has been working as a research associate and lecturer in the Department of Physiological Psychology at the University of Bielefeld. Her research interests are functional amnesias, affective disorders, cultural neuroscience, epigenetics, and the neurobiological underpinnings of violent behavior.

Raymond Tallis
Why Neuroscience Will never Explain Consciousness

The belief that consciousness is identical with activity in certain parts of the brain, so that "you are your brain" is now widely accepted. It is, however, mistaken. While the brain is a *necessary* condition of every aspect of consciousness, from the slightest tingle of sensation to the most exquisitely constructed sense of self, neural activity is not *sufficient* by itself to explain consciousness. This is evident from the fact that there is no fundamental difference between that small minority of neural activity correlated with consciousness and that which is not associated with consciousness. The consciousness-neural activity identity theory faces numerous problems, arising from the fact that nerve impulses are material events in a piece of matter (the brain). First, there is no explanation of intentionality – that through which contents of consciousness are *about* entities other than themselves. Intentionality, which points in the opposite direction to that of the sequence of causes and effects that are supposed to bring about consciousness, is not seen elsewhere in the material world. Second, the development of the scientific notion of matter is associated with *the elimination of appearance*, beginning with those "secondary qualities" such as color and feelings

of warmth that form the content of consciousness. Third, neural activity is unlike the experiences that it is supposed to be identical with. Fourth, there are properties of consciousness – such as simultaneous unity and multiplicity, and explicit temporal depth and tensed time – that are not seen in the material world. Acknowledging that the failure to arrive at a neural account of consciousness is not a temporary problem (which can be resolved by further research) will open the way to a fundamental re-think that will help us toward an understanding of the difference between brains and people.

Raymond Tallis is a British philosopher, humanist, poet, novelist, cultural critic, and retired doctor. He studied medicine at Oxford University and did post-graduate work at St Thomas' Hospital in London. He retired in 2006 as Emeritus Professor of Geriatric Medicine at the University of Manchester. Raymond Tallis has published extensively in areas within medicine – he is the main editor of *Brocklehurst's Textbook of Geriatric Medicine and Gerontology* (2003) – and in areas outside it, including the novel *Absence: A Metaphysical Comedy* (1999) and several volumes of verse, the most recent being *Fathers and Sons* (1993). In 1988, he published two books critical of post-structuralism, *Not Saussure: A Critique of Post-Saussurean Literary Theory* (1995) and *In Defence of Realism* (1998). He is also the author of *The Explicit Animal: A Defence of Human Consciousness* (1990); *Theorrhoea and After* (1998); *Hippocratic Oaths: Medicine and its Discontents* (2004); *The Enduring Significance of Parmenides: Unthinkable Thought* (2007); *The Kingdom of Infinite Space: A Fantastical Journey around Your Head* (2008); and *Michelangelo's Finger* (2010).

Fernando Vidal

Neuroesthetics, or How to Get Rid of Art

Neuroesthetics aims at explaining esthetic experience, especially that of the reception of the visual arts, with the concepts and tools of neuroscience, particularly neuroimaging techniques. One of its chief proponents, neurobiologist Semir Zeki, sees the field as "dictated by a truth" he considers "axiomatic – that all human activity is dictated by the organization and laws of the brain; that, therefore, there can be no real theory of art and aesthetics unless neurobiologically based." Zeki's axiom embodies the ideological core of neuroesthetics. Like some other "neuro" areas born since the Decade of the Brain, neuroesthetics institutionalized rapidly and attracts considerable funding. Like those areas, and like both esthetics and the neu-

rosciences, it is pursued in a variety of locations and from different methodological perspectives. Now, although neuroesthetics largely derives from the neurobiology of perception, it is not ultimately concerned with perception per se, but with general questions, such as What is art? What is beauty? How does esthetic judgment work? and, of course, How do they all emerge from the brain? I will here examine the internal logic of two varieties of neuroesthetics, one focused on perception, the other on empathy, and argue that, whatever else they do, they elucidate neither art nor esthetic experience.

Fernando Vidal, born and raised in Buenos Aires, was an undergraduate at Harvard, and then went on to do graduate work in developmental psychology and the history and philosophy of science at the Universities of Geneva and Paris. He received his PhD from Geneva, and a habilitation from the École des Hautes Études en Sciences Sociales, Paris. As a Guggenheim Fellow, as well as an Athena Fellow of the Swiss National Science Foundation, he has worked on various topics in the history of the human sciences, including the early development of psychology and anthropology, sexuality in the 18th century, psychoanalysis and psychiatry in the early 20th century, the progressive education movement in the interwar years, and miracles as epistemic things in the early modern period and the Enlightenment. His publications include *Piaget Before Piaget* (1994), *Les Sciences de l'âme, XVIe–XVIIIe siècle* (2006); an edition of Jean Starobinski's writings on the history of the body (*Las razones del cuerpo*; 1999); *The Moral Authority of Nature* (co-edited with Lorraine Daston; 2004); *Believing Nature, Knowing God* (a thematic issue of *Science in Context*, co-edited with Bernhard Kleeberg; 2007); and "Brainhood, Anthropological Figure of Modernity," *History of the Human Sciences* 22 (2009). His current work deals with the cultural history of the "cerebral subject" – from film and science fiction to neurobics and neurophilosophy. He is interested specifically in the emergence of the belief that the brain is the only part of the body we need in order to be ourselves, and more generally in a longue-durée history of the relations between notions of bodily continuity and personal identity.