

IHPST NEWSLETTER, SEPTEMBER 2005

1. “Science & Education”, Vol.14, Nos.3-5,

A special triple issue (Vol.14, Nos.3-5, 290pp) of the journal ‘Science & Education’ has recently been published. It contains selected, reviewed and revised papers from the Seventh IHPST conference held in Winnipeg, 2003.

The contents follow.

INTRODUCTION

ART STINNER & DON METZ / Footprints in the Snow

PHILOSOPHICAL ISSUES

NAHUM KIPNIS / Analogy in Science and in Science Teaching

MICHAEL TSEITLIN & IGAL GALILI / Physics Teaching and the Search for the Self: From Physics as a Discipline to Physics as a Discipline-Culture

ROCCO J. PERLA & JAMES CARIFIO / The Nature of Scientific Revolutions from the Vantage Point of Chaos Theory: Toward a Model of Scientific Change

COLIN GAULD / Habits of Mind, Scholarship and Decision Making in Science and Religion

DANIEL GIL-PÉREZ, AMPARO VILCHES FERNÁNDEZ, ISABEL FERNÁNDEZ MONTORO, ANTONIO CACHAPUZ, JOÃO PRAIA, PABLO VALDÉS & JULIA SALINAS / Technology as ‘Applied Science’: A Serious Misconception that Reinforces Distorted and Impoverished Views of Science

JENARO GUIASOLA, JOSÉ M. ALMUDÍ & CARLES FURIÓ-MÁS / The Nature of Science and Its Implications for Physics Textbooks: The Case of Classical Magnetic Field Theory

HISTORICAL ISSUES

HANS C. VON BAEYER / Dr. W^m Small: Echoes of a Quiet Life

SIEYA ABIKO / The Light-Velocity Postulate: The Essential Difference between the Theories of Lorentz-Poincaré and Einstein

PEDAGOGICAL ISSUES

MORDECHAI BEN-ARI / Problems of Situated Learning Theory in a High-Technology World

ZOUBEIDA R. DAGHER & DANIELLE FORD / How are Scientists Portrayed in Children’s Science Biographies?

GERALD SKOOG / The Coverage of Human Evolution in High School Biology Textbooks in the 20th Century and in Current State Science Standards

ERIC M. HOWE & DAVID W. RUDGE / Recapitulating the History of Sickle-Cell Anemia Research: Improving Students’ NOS Views Explicitly and Reflectively

JEFF BABB / Mathematical Concepts and Proofs from Nicole Oresme: Using the History of Calculus to Teach Mathematics

DEBORAH L. BEGORAY & ARTHUR STINNER / Representing Science Through Historical Drama: *Lord Kelvin and the Age of the Earth Debate*

ROBERT CARSON & STUART ROWLANDS / Mechanics as the Logical Point of Entry for the Enculturation into Scientific Thinking

Journal subscriptions - USD85 (1 year), USD160 (2 years), USD235 (3 years) with half rate for students and third-world scholars - can be effected at the IHPST web site www.ihpst.org.

2. Leeds Conference Report

The 8th International History, Philosophy and Science Teaching Group's conference was held in Leeds, July 15-18, 2005.

There were about 200 participants from 30 countries – Armenia, Brazil, Cuba, Denmark, England, Finland, Greece, Hungary, India, Japan ... through to Venezuela. The keynote addresses were given by Dr Meera Nanda, Professor Harry Collins and Professor Peter Bowler (shared with the British Society for the History of Science). There were 170 individual presentations and eleven poster presentations. Full details of the papers and presenters are available at the conference web site: www.ihpst2005.leeds.ac.uk/.

The conference was very successful, with many people remarking that it was the best academic conference they have attended. The group's tradition of combining intellectual stimulation and engagement with warm social interaction was continued. Having all lunches and tea breaks together in a university hall facilitated this interaction.

A notable feature of the conference was the productive mixture of science educators, philosophers, historians, cognitive scientists and science teachers. This maintained the tradition of such engagement at IHPST conferences. Most agreed that the serious theoretical and pedagogical issues facing science education can only be resolved with such cross-disciplinary interaction and engagement.

By the end of September, the Proceedings of the conference will be available in pdf format on the web site. Subsequently a selection of reviewed and refereed conference papers will be published in special issues of *Science & Education* guest edited by Jonathan Osborne and Mick Nott. Conference papers to be considered for the journal issues need to be submitted in parallel with those for the Proceedings. This is done by logging on to: <https://www.editorialmanager.com/sced/>. Papers should be submitted by mid-September.

The Group elected Professor William McComas (University of Southern California) as President to succeed Professor Art Stinner, and to serve through to the 2007 conference.

The Group's president, Professor Art Stinner, thanked the conference organising committee, especially the chair Jonathan Osborne and secretary Mick Nott, for their sterling work in bringing the conference to fruition and making it so successful. This was endorsed by all.

The Group's thanks were also expressed for Wellcome Trust's generous support of the conference that enabled a good number of English school teachers, and scholars from depressed economies, to participate.

3. Future IHPST Conferences

Arrangements have already been made for the 9th (2007) and 10th (2009) IHPST conferences.

9th IHPST Conference, July 5-8 (tbc), 2007, University of Calgary
Conference Chair: Professor Ian Winchester
Conference Secretary: Linda Lentz
Programme Chair: HsingChi Wang (ihpst07@ucalgary.ca)

10th IHPST Conference, June 24-28, 2009, University of Notre Dame,
Conference Chair: Professor Don Howard (email: dhoward1@ND.EDU).

You might like to schedule these meetings into future writing and travel plans, and bring them to the attention of related groups that might like to schedule meetings so as to enable participation at IHPST and their own conference.

4. Third Hellenic History, Philosophy and Science Teaching Conference, 19-25 September 2005

The 3rd Hellenic Conference on “History, Philosophy and Science Teaching” will be held in Athens 19-25 September 2005. The event is planned to take place in conjunction with the European Physical Society Conference “Notions of Physics in Natural Philosophy” which will be held between 23-25 Sept. 2005 ie. in the last 3 days of the Hellenic HPST Conference.

The Athens EPS Conference is part of a series of events organized by EPS to commemorate the 100th anniversary from the publication of Einstein’s famous paper on Relativity (2005 is the World Year of Physics).

The language of the HPST Conference is Greek while the language of the EPS Conference is English and French to encourage and facilitate the participation of scholars from around Europe and the rest of the world. Both events are endorsed by the Hellenic Physical Society.

The Conference Website is: http://asel.primedu.uoa.gr/synedrio/sinedrio_index_en.htm

For any information please contact the Conference Organisers:

- A/Prof. Constantine D. Skordoulis (kskordul@primedu.uoa.gr)
Department of Education, University of Athens
- Prof. Efthymios Nicolaidis (efnicol@eie.gr)
History & Philosophy of Science Program, National Hellenic Research Foundation.

5. Second International Pendulum Conference, Sydney, October 13-15, 2005

The Second International Pendulum Conference will be held at the University of New South Wales, Sydney, Australia from Wednesday evening October 13 to Saturday evening October 15, 2005.

There will be a 3-day research strand of the conference concurrent with a 2-day teachers meeting. Many of the contributors to the *Pendulum* anthology will be presenting and elaborating their research; additionally new research on scientific, historical, methodological, horological and pedagogical aspects of pendulum motion will be presented.

The concurrent teachers’ meeting (Friday and Saturday) will involve Sydney primary and high school teachers who have been developing and trialing innovative pendulum-based lessons and programmes.

Some of the Conference Presenters will be:

Amir Aczel is a visiting fellow at the Centre for History and Philosophy of Science at Boston University. He is the author of nine books including *Fermat’s Last Theorem* (1996),

Probability: Why There Must be Intelligent Life in the Universe (1998), *God's Equation: Einstein, Relativity and the Expanding Universe* (1999), *The Compass: The Invention that Changed the World* (2001), *Entanglement: The Greatest Mystery in Physics* (2002) and *Pendulum: Léon Foucault and the Triumph of Science* (2003).

Igal Galili is a professor and Head of the Science Teaching Center at the Hebrew University of Jerusalem, from where he obtained his BSc, MSc and PhD degrees in physics.

Constantine D. Skordoulis is associate professor in the Department of Primary Education, University of Athens. He obtained his PhD in physics from the University of Kent, and has been a visiting researcher in Oxford, Jena and Groningen universities.

Don Metz assistant professor, Education Program, University of Winnipeg. He graduated in physics and obtained his PhD in science education from the University of Manitoba. He taught high school for twenty years, and has worked on provincial curriculum development.

David Hestenes is professor of Physics at Arizona State University and leader of a distinguished research team in physics education.

Nagarjuna Gadiraju is a lecturer at the Homi Bhaba Centre for Science Education, Mumbai, India. He has been a school and college biology teacher, and has a PhD degree in philosophy of science.

Colin Gauld is a research associate at the University of New South Wales, where he had been a senior lecturer in science education, and was chief examiner of HSC Physics in NSW

HsingChi Wang is an assistant professor in the Science Education at the University of Calgary. She is a physics graduate and a research associate with the USA TIMSS group.

Robert Carson is Department Head of Education at Montana State University. He researches the use of history and philosophy of science in science and maths teaching.

Norman Heckenberg is Reader and Director of the Physics Museum, Uni. of Queensland.

Kevin de Berg is a senior lecturer in Chemistry at Avondale College.

Alan Emmerson is an amateur horologist and retired aeronautical engineer.

Dimitris Koliopoulos is a lecturer in the Department of Primary Education, University of Patras. He has degrees in Physics from Thessaloniki and Science Education (Paris).

Margaret Wegener is a lecturer in Department of Physics, University of Queensland.

Michael Matthews and *Rick Connor* are in the School of Education at UNSW.

Offers of papers for conference presentation are welcome. Below is a timetable for paper submission and conference registration.

August 22nd Paper Title and 3-500 word abstract to be communicated to conference secretary. This should follow the format used in *Science & Education* journal.
September 19th Complete paper to be sent as email attachment, using *Science & Education* style and bibliographical format.

October 3rd Registration to be completed.

Accommodation costs will vary from about USD60 to USD100 per night depending on style of accommodation chosen. Participants will be responsible for their own accommodation arrangements with the participating hotel and motel.

Conference accommodation will be at the:

Crowne Plaza Hotel, Coogee Beach (<http://www.ichotelsgroup.com/h/d/cp/1/en/hd/SYDCB?&>) .
Cost is approximately USD100 per night, with IPP/UNSW discount.

Barker Lodge Motel, Kensington (adjacent to UNSW). Cost is approximately USD90 per night (single), USD100 (double). Contact reservations@barkerlodge.com.au, or 61-2-9662.84444.

Rooms should be booked as soon as possible.

Registration Form and other details are available at conference web site:

www.arts.unsw.edu.au/pendulum/

6. Pendulum Anthology

The International Pendulum Project (IPP) has been functioning since 2002 when the first pendulum research conference was held at UNSW in Sydney. The IPP promotes scientific, historical and methodological studies of the pendulum, and supports enriched teaching of pendulum-related topics in school.

Springer have now published a 540 page anthology of 31 papers arising from the first research phase of the IPP:

The Pendulum: Scientific, Historical, Philosophical & Educational Perspectives (Michael R. Matthews, Colin Gauld & Arthur Stinner eds.)

Book contents and order details (cost USD35) can be seen at: www.arts.unsw.edu.au/pendulum/ .

7. Book Notes

Brief notes follow on these books that deal with subjects of interest to IHPST members.

Flick, L.B. & Lederman, N.G. (eds.): 2004, *Scientific Inquiry and Nature of Science: Implications for Teaching, Learning and Teacher Education*, Kluwer, Dordrecht.

Gratzer, W.B.: 2005, *The Undergrowth of Science: Delusion, Self-deception and Human Frailty*, Oxford University Press, Oxford.

Haack, S.: 2003, *Defending Science within Reason: Between Scientism and Cynicism*, Prometheus Books, Amherst, NY.

Lacey, H.: 2005, *Values and Objectivity in Science: The Current Controversy about Transgenic Crops*, Rowman & Littlefield Publishers, Lanham, MD.

Mellor, D.H.: 2005, *Probability: A Philosophical Introduction*, Routledge, London.

Hodgkin, L.: 2005, *A History of Mathematics from Mesopotamia to Modernity*, Oxford University Press, Oxford.

Flick, L.B. & Lederman, N.G. (eds.): 2004, *Scientific Inquiry and Nature of Science: Implications for Teaching, Learning and Teacher Education*, Kluwer, Dordrecht. (ISBN 1-4020-2671-4, 456pp)

The book has 19 chapters in four parts: Historical and Contemporary Educational Contexts, Teaching and Learning Scientific Inquiry, Curriculum and Assessment, and Teaching and Learning about the Nature of Science. Many of the chapters would be of interest to IHPST members, but of specific interest would be the chapters by: Rodger Bybee 'Scientific Inquiry and Science Teaching', George DeBoer 'Historical Perspectives on Inquiry Teaching in Schools', Norman Lederman 'Syntax of Nature of Science within Inquiry and Science Instruction', and Richard Duschl 'Relating History of Science to Learning and Teaching Science: Using and Abusing'.

Contributors make the important distinction between teaching *about* scientific inquiry and teaching *by* inquiry. The two are completely unrelated: the former can be done in a quite didactic manner as is common in standard philosophy of science programmes; and the latter can leave students completely ignorant of the nature of scientific inquiry, much less of the nature of science itself. One reason for the second outcome is that science teachers routinely mistake scientific method for scientific methodology. Method skills are important, it is how one gets data and information in inquiry; methodology is also important, if not more important, it is concerned with what one does with the data that method skills provide. This latter methodological task involves statistical inference, probabilistic reasoning and basic epistemological positions. Method skills result in readings and points on a graph, methodology skills enable students to draw conclusions about how these evidential points bear or do not bear upon a theory or on rival theories. Lederman is correct in insisting that these methodological skills have to be taught explicitly, they cannot be picked up by osmosis, by hanging around a laboratory. Method skills might be picked up by example, or 'tacitly' as Michael Polanyi used say, but mastery of these skills do not constitute mastery of scientific method. Scientific method is constituted by both method and methodology.

The book is good and timely. The National Research Council in the US released its *Inquiry and the National Science Education Standards* in 2000, and the book is a response to it. But this is also one of the book's shortcomings. All 27 contributors are from the United States. The subject of 'Scientific Inquiry and the Nature of Science' has been investigated elsewhere in the world, but nothing in the book gives any indication of that. George DeBoer's chapter is predictably good and informative, but even it is preoccupied with the history of inquiry teaching in the USA. He mentions Herbart in Germany and Armstrong's heuristic method in England, but then it is straight back to Dewey and Schwab. No mention is made of the Nuffield Schemes in the United Kingdom which for decades explicitly promoted an inquiry approach to science teaching, and which have been well researched and written on – by Edgar Jenkins for instance.

Another shortcoming is the absence of philosophical input. In the post-Kuhnian era, philosophers of science have given considerable attention to scientific methodology – see for example Peter Godfrey-Smith's *Theory and Reality* (University of Chicago Press, 2003), James Ladyman's *Understanding Philosophy of Science* (Routledge 2002) and contributions to Robert Nola & Howard Sankey (eds.) *After Popper, Kuhn and Feyerabend* (Kluwer 2000). Having a commissioned chapter on these developments in philosophy, written by a philosopher, would have been of great benefit to the science educators reading the book. Without this constant interaction with the philosophical tradition, there is a danger that science education will just drift off into a comfortable but unstimulated world.

The book also has two minor editorial shortcomings. The first is that there is no consolidated bibliography. Each of the chapters has a considerable bibliography, but the editors would have done the profession a service by producing a consolidated reference list. The latter would have put

in one place the most extensive list of research on the topic yet produced. The second shortcoming is that there is no 'About the Authors' section. This is always useful to have. It is nice to know whether chapter authors are from science, education, psychology or other departments; and it is also nice to know the education trajectory of authors.

Gratzer, W.B.: 2005, *The Undergrowth of Science: Delusion, Self-deception and Human Frailty*, Oxford University Press, Oxford. (ISBN 019-850707-0, 328pp)

In 1830 Charles Babbage published his *Reflections on the Decline of Science in England* in which he distinguished four categories of scientific fraud: Hoaxing (fraud practiced with the intention that it be discovered and hence ridiculing those that have credited it – think the recent Sokal Hoax), Forging (fraud perpetrated to advance the career of the forger), Trimming (where adjustments are made to data by removing out-lying observations and points) and Cooking (where data is manufactured to fit favoured theories and formulae). Babbage thought that scientific fraud was not widespread. Robert Merton, in his classic *The Sociology of Science* (1942) agreed with Babbage and thought that the virtual absence of fraud in the annals of science was due to the internal workings of the scientific enterprise (in contrast to political or religious enterprises, for instance). We now know that Babbage and Merton were too optimistic in the faith they had in the scientific community – fraud does happen.

Gratzer's eleven chapter book lucidly paints the picture of scientific fraud from Blondlot's N-Rays through Irving Langmuir's exposé of the made-up fundamental particles of Davis and Barnes, to Derjaguin's 'science' of polywater, to Soviet genetics and chemistry, to National Socialist physics and biology, to the rise, fall and rise again of eugenics. Gratzer labels all of this 'pathological science'. He rightly points out false theories and imagined phenomena sometimes spread through the scientific community in a way that is comparable to public hysteria associated with UFO sightings, alien abductions and 'recovered memory' revelations.

The book provides a useful corrective to too-rosy pictures of the scientific enterprise, but the cumulative force of the episodes precisely depends on there being a distinction between proper science and pathological science. This is the claim of orthodox philosophers of science who maintain that philosophy of science is a normative matter, and cannot be dissolved into descriptive sociology of science.

Gratzer is a regular reviewer for *Nature*, and edited the *Longman Literary Companion to Science*, so it is not surprising that the book is well written and reads easily. Each chapter has a guide to further reading – the usefulness of which would have been enhanced if a separate bibliography had been included.

Haack, S.: 2003, *Defending Science within Reason: Between Scientism and Cynicism*, Prometheus Books, Amherst, NY. (ISBN 1-59102-117-0, 412pps)

This 12-chapter, 440 page, 600-item bibliography, book follows on the author's earlier *Manifesto of a Passionate Moderate* (1998) and reproduces the earlier book's fine writing style, its lucidity, and its attention to detailed and informed argument. In the Preface Haack says that the book's purpose is to 'articulate a new, and hopefully a true, understanding of what science is and does. Discussions of the Old Deferentialism, with its focus on the "logic of the science", on structure, rationality, and objectivity, and of the New Cynicism, with its focus on power, politics, and rhetoric – and of the deep cultural currents of admiration for and uneasiness about science of which they are manifestations – serve only as background to this constructive project' (p.9).

Chapters deal with, among other things, Sociology of Science, Literature and Science, Law and Science, Religion and Science, Values and Science. In the religion chapter, Haack's argument leads her to criticism of Stephen Jay Gould's much-lauded NOMA position. Haack writes 'Gould's position may seem attractively irenic; but its appeal derives from its vagueness and ambiguity, and evanesces under closer scrutiny' (p.287). She is also critical of Richard Swinburne's efforts to accommodate the Problem of Evil within traditional Christian theological belief.

Lacey, H.: 2005, *Values and Objectivity in Science: The Current Controversy about Transgenic Crops*, Rowman & Littlefield Publishers, Lanham, MD. (ISBN 0-7391-1141-8, 286pp)

Lacey, an emeritus professor of philosophy at Swarthmore College, has for many years worked on the main theme of this book. The central arguments were developed in his *Is Science Value Free?* (Routledge, 1999), and they were critiqued and defended in a special issue of *Science & Education* (Volume 8 Number 1, 1999). His core position is that there are both social and cognitive values at play in the conduct of science, and that the bulk of Western science has been conducted according to what he calls 'materialist strategies' (although such strategies do not necessarily entail adoption of materialist metaphysics), and that although such science is cognitively impartial, it is not neutral with respect to social interests. It is on these grounds that, in his 1999 publications, he criticizes the science of the Green Revolution.

The first five chapters of this book rehearse and develop the core positions of 1999, as well as dealing explicitly with the topic of Multicultural Science, a topic of considerable interest to many science educators. The following six chapters focus on the science and controversies associated with the commercial use of transgenic, or genetically engineered, seeds. Lacey lays out the contrasts between transgenic agriculture and the scientific research that enables it, and agroecological agriculture and the corresponding research which is only partially done. He observes that 'The successful conduct of research under agroecological strategies, the expansion and improvement of agroecological farming, and the activities and growth of movements that embody the values of popular participation are inseparably linked. The three flourish or decline together' (p.241).

With genetic engineering topics, and science-technology-society themes, common in contemporary science programmes, school teachers will benefit from attention to Lacey's careful arguments.

Mellor, D.H.: 2005, *Probability: A Philosophical Introduction*, Routledge, London. (ISBN 0-415-28251-9, 152pp)

Mellor is emeritus professor of philosophy at the University of Cambridge. The book is written so that philosophy students might be as familiar and competent with notions of probability as they are expected to be with logical notions. Mellor says that the latter is a widely accepted part of philosophical training and he sets out to show that the former should likewise be seen as essential to competent philosophical thinking.

The book is carefully written, with minimum mathematical formalism, enough logical apparatus to sustain the exposition, and maximum conceptual elaboration. In the Introduction Mellor distinguishes between: *Physical* probabilities or what might be called *chances*; *epistemic* probabilities; and *subjective probabilities* or what might be called *credences*. This classification is enough to get the book underway, and as he works through the chapters the distinctions are rendered less watertight. The topics dealt with include: chance, frequency, possibility, propensity, credence, confirmation and Bayesianism. There is a comprehensive bibliography, and each chapter has a guide for further reading.

Given that so much decision making in science – hypothesis acceptance or rejection given certain evidence - is based upon probabilistic reasoning, and given that teaching scientific methodology features so strongly in school programmes, then Mellor’s book has a useful contribution to make to teachers’ deeper understanding of the subject.

Hodgkin, L.: 2005, *A History of Mathematics from Mesopotamia to Modernity*, Oxford University Press, Oxford. (ISBN 0-19-852937, 280 pps)

The author has taught both mathematics and history of mathematics, and the book has its origins in a history of mathematics course taught at King’s College, London. It covers the evolution of mathematics through time and across the major Eastern and Western civilizations. It begins in Babylon, then describes the trials and tribulations of the Greek mathematicians. The important, and often neglected, influence of both Chinese and Islamic mathematics is covered in detail. The book concludes with modern mathematics, covering recent developments such as the advent of the computer, chaos theory, topology, mathematical physics, and the solution of Fermat’s Last Theorem. The book is 280 pages and has 100 illustrations, and an extensive cross-referenced bibliography.

8. Books Received

Williamson, J.: 2005, *Bayesian Nets and Causality: Philosophical and Computational Foundations*, Oxford University Press, Oxford. (ISBN 0-19-853079-X, 240pp)

Malcolm, N. & Stedall, J.: 2005, *John Pell (1611-1685) and His Correspondence with Sir Charles Cavendish: The Mental World of an Early Modern Mathematician*, Oxford University Press, Oxford. (ISBN 0-19-856484-8, 658pp)

Russ, S.: 2004, *The Mathematical Works of Bernard Bolzano*, Oxford University Press, Oxford. (ISBN 0-19-853930-4, 696pp)

Butterfield, J. & Halvorson, H. (eds.): 2004, *Quantum Entanglements: Selected Papers of Rob Clifton*, Oxford University Press, Oxford. (ISBN 0-19-927015-5, 462pp)

9. Current Research

Apart from contributions to *Science & Education* the following are some papers published in recent years that bear upon the research concerns of the IHPST Group. Suggestions for up-dating this list should be sent to the Editor at m.matthews@unsw.edu.au

Niaz, M.: 2005, ‘The Quantitative Imperative vs the Imperative of Presuppositions’, *Theory & Psychology* **15** (2), 247-256.

Niaz, M.: 2005, ‘Do General Chemistry Textbooks Facilitate Conceptual Understanding?’, *Química Nova* **28**(2), 335-336.

Brito, A., Rodríguez, M.A. & Niaz, M.: 2005, ‘A Reconstruction of Development of the Periodic Table Based on History and Philosophy of Science and its Implications for General Chemistry Textbooks’, *Journal of Research in Science Teaching* **42**(1), 84-111.

- Abd-El-Khalick, F. 2005, 'Developing Deeper Understanding of Nature of Science: The Impact of a Philosophy of Science Course on Preservice Science Teachers' Views and Instructional Planning', *International Journal of Science Education* **27**(1), 15-42.
- Lawson, A.E.: 2005, 'William Harvey, Predicting Capillaries, and the Nature of Science: One More Time', *The American Biology Teacher* **67**(4), 202-203.
- Lawson, A.E.: 2005, 'Conducting High Quality Research', *International Journal of Science and Mathematics Education*, **3**(1), 1-5.
- Lawson, A.E.: 2005, 'What is the Role of Induction and Deduction in Reasoning and Scientific Inquiry?' *Journal of Research in Science Teaching* **42**(6), 716-740.
- Lawson, A.E.: 2004, 'The Nature and Development of Scientific Reasoning: A Synthetic View', *International Journal of Science and Mathematics Education*, **2**(4), 307-338.
- Aalsvoort, J.v.: 2004, 'Logical Positivism as a Tool to Analyse the Problem of Chemistry's Lack of Relevance in Secondary School Chemical Education', *International Journal of Science Education* **26** (9), 1151-1168.
- Niaz, M.: 2004, 'Exploring Alternative Approaches to Methodology in Educational Research', *Interchange* **35**(2), 155-184.
- Abd-El-Khalick, F. & Akerson, V.L.: 2004, 'Learning as Conceptual Change: Factors Mediating the Development of Preservice Elementary Teachers' Views of the Nature of Science', *Science Education* **88**(5), 785-810.
- Allchin, D.: 2004, 'Should the Sociology of Science Be Rated X?', *Science Education* **88**(6), 934-946.
- Bartholomew, H., Osborne, J. & Ratcliffe, M.: 2004, 'Teaching students "ideas about science": Five dimensions of effective practice', *Science Education* **88** (5), 655-682.
- Donnelly, J.F.: 2004, 'Humanizing Science Education', *Science Education* **88**(5), 762-784.
- Duschl, R.A.: 2004, 'Relating History of Science to Learning and Teaching Science: Using and Abusing'. In L.B. Flick & N.G. Lederman (eds) *Scientific Inquiry and Nature of Science: Implications for Teaching, Learning, and Teacher Education*, Kluwer Academic Publishers, Dordrecht, pp.319-330.
- Matthews, M.R.: 2004, 'Thomas Kuhn's Impact on Science Education: What Lessons can be Learnt?', *Science Education* **88**(1), 90-118.
- Niaz, M., Rodríguez, M.A. & Brito, A.: 2004, 'An appraisal of Mendeleev's contribution to the development of the periodic table', *Studies in History and Philosophy of Science* **35A**, 271-282.
- Niaz, M.: 2004, 'Did Columbus *hypothesize* or *predict* that if he sailed due West, he would arrive at the Indies?', *Journal of Genetic Psychology* **165**, 149-156.
- Rodríguez, M.A. & Niaz, M.: 2004, 'A reconstruction of structure of the atom and its implications for general physics textbooks: A history and philosophy of science perspective', *Journal of Science Education and Technology* **13**, 409-424.
- Rodríguez, M.A. & Niaz, M.: 2004, 'The oil drop experiment: An illustration of scientific research methodology and its implications for physics textbooks', *Instructional Science* **32**, 357-386.
- Sandoval, W. A. & Reiser, B. J.: 2004, 'Explanation-driven Inquiry: Integrating conceptual and epistemic scaffolds for Scientific inquiry', *Science Education*, **88** (3), 345-372.
- Schwartz, R.S., Lederman, N.G., Crawford, B.: 2004, 'Developing views of the nature of science in an authentic context: An explicit approach to bridging the gap between nature of science and scientific inquiry', *Science Education*, **88** (4), 610-645.
- Siegel, H.: 2004, 'The Bearing of Philosophy of Science on Science Education, and Vice Versa: The Case of Constructivism', *Studies in History and Philosophy of Science*, **35A**, 185-198.
- Symington, D. & Tytler, R.: 2004, 'Community Leaders' Views of the Purposes of Science in the Compulsory Years of Schooling', *International Journal of Science Education* **26**(11), 1403-1418.
- Westerlund, J. & Fairbanks, D.: 2004, 'Gregor Mendel and "Myth-Conceptions"', *Science Education* **88**(5), 754-758.

Wickman, P.O.: 2004, 'The practical Epistemologies of the classroom: A study of laboratory work' *Science Education*, **88** (3), 325-344.

10. Coming Conferences

September 19-25, 2005. Third Hellenic HPS & ST conference. Details at :

http://asel.primedu.uoa.gr/synedrio/sinedrio_index_en.htm

October 13-15, 2005 2nd International Pendulum Conference, Sydney. Details at:

www.arts.unsw.edu.au/pendulum/

March 26-30, 2006. Symposium on "Science History and Its Applications to Chemical Education", as part of American Chemical Society meeting in Atlanta, GA. Details from: Seth C. Rasmussen, seth.rasmussen@ndsu.edu.

April 3-6, 2006, NARST conference, San Francisco. Details at: <http://www.educ.sfu.ca/narstsite/>

April 8-12, AERA conference, San Francisco

April 21-24, PES conference, Puerto Vallarta, Mexico. Details at: <http://cuip.net/pes/>

11 *Science & Education* Special Issues: Prospective Theme Topics

The journal *Science & Education* has over the years published a number of thematic issues.

1996, 'Religion and Science Education', *Science & Education* **5**(2)

1997, 'Philosophy and Constructivism in Science Education', *Science & Education* **6**(1-2)

1999, 'Values in Science and in Science Education', *Science & Education* **8**(1).

1999, 'Galileo and Science Education' *Science & Education* **8**(2).

1999, 'Children's Theories and Scientific Theories', *Science & Education* **8**(5).

2000, 'Thomas Kuhn and Science Education', *Science & Education* **9**(1-2).

2000, 'Constructivism and Science Education', *Science & Education* **9**(6).

2003, 'History, Philosophy and the Teaching of Quantum Theory', *Science & Education* **12**(5-6)

2004, 'Positivism and Science Education: A Reevaluation', **13**(1-2)

Special Issues are planned for 2006, and contributions are invited. Manuscripts are reviewed in the normal manner (usually three reviewers). Authors can contact the guest editors listed below, or the journal editor, for further details.

'Women, Science Education, & Feminist Theory: An Appraisal',

(Cassandra Pinnick email: cassandra.pinnick@wku.edu)

1st October 2005

'The Nature of Science: Identifying, Teaching and Assessing NOS' (Joanne Olson & Michael

Clough emails: jkolson@iastate.edu, mclough@iastate.edu)

1st October 2005

'Thought Experiments in Science and in Science Education',

(Miriam Reiner email: miriamr@stanford.edu

1st October 2005

'The Centenary of Relativity Theory: Historical, Philosophical and Pedagogical Reflections'

(Fabio Bevilacqua email: bevilacqua@fisicavolta.unipv.it)

1st November 2005

'Social and Ethical Issues in Science Education'

1st June 2006

(Dana L. Zeidler email: zeidler@coedu.usf.edu & Troy D. Sadler, email:

tsadler@coe.ufl.edu)

12. Ideas, Evidence & Argument in Science Education

Professor Jonathan Osborne (King's College), Dr Shirley Simon (The Institute of Education) and Dr Sibel Erduran (University of Bristol) have developed materials to assist teachers of science at elementary and secondary schools develop their skills in teaching about ideas, evidence and argument in science education.

The materials consist of an in-service workshop pack supplied on a CD which is supported by a DVD of 28 instances of teachers engaging in the kind of teaching necessary to develop children's thinking and reasoning in science. In addition, there is a resources pack to support such teaching approaches in the classroom.

The materials are a product of an Economic Social and Research Council funded research project on enhancing the quality of argumentation in school science and a grant from the Nuffield Foundation to develop training materials for teachers.

The pack costs UKP25 and may be ordered from:

The Science Secretary
Department of Education & Professional Studies
King's College London
Franklin-Wilkins Building
Waterloo Road
London SE1 9NH
UK
Email: deps@kcl.ac.uk

13. Publications for Sale

The following publications are available from the IHPST Group:

- #1 *CD Proceedings of the 6th IHPST Conference, Denver, 2001*, 100+ papers, W. McComas (ed.), USD10 (postage included).
- #2 *CD Proceedings of the 7th IHPST Conference, Winnipeg, 2003*, 100+ papers, D. Metz (ed.), USD10 (postage included).
- #3 *Time for Science Education*, M.R. Matthews, Kluwer, 2000, 440pp, USD20 (postage included).
- #4 *Science Education and Culture*, F. Bevilacqua, E. Giannetto & M.R. Matthews (eds.), Kluwer, 2001, 362pp, USD20 (postage included).
- #5 *Challenging New Zealand Science Education*, M.R. Matthews, Dunmore Press, 1995, 256pp, USD10 (postage included).
- #6 *Science & Education* journal Volume 12, 2003, 808 pps, USD25 (postage included).
- #7 *Science & Education* journal Volume 2, 1993, 382pp, USD10 (postage included).
- #8 *The Pendulum: Scientific, Historical, Philosophical & Educational Perspectives* (Michael R. Matthews, Colin Gauld & Arthur Stinner eds.), USD35

To purchase any of the above, send letter or email, with complete mailing address and indication of what publications are required, to address below. Cheques payable to 'IHPST', or send full credit card details (visa, or mastercard). Alternatively order from IHPST web site: www.ihpst.org

13. IHPST Email List

This list is newly created. It is anticipated that it will be used sparingly, perhaps once a month, to send group information such as contained in this Newsletter. It is a closed list, not a discussion list.

If you receive this email message and wish to remove yourself from the IHPST list, send a message to: majordomo@explode.unsw.edu.au . In the body of the message, not the subject line, simply write: 'unsubscribe ihpst-group'.

Alternatively, if you have friends or colleagues who would like to subscribe to the list, tell them to send a message to: majordomo@explode.unsw.edu.au . In the body of the message, not the subject line, simply write: 'subscribe ihpst-group'.

14. Future Newsletter Items

Items for inclusion in the IHPST *Newsletter* are appreciated. These can be items for the 'Recent Research', 'Recent Books', 'Books' or 'Conferences' sections.

Please email newsletter material (or journal subscriptions or publication orders) to:

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Email: m.matthews@unsw.edu.au