



## **International History, Philosophy and Science Teaching Group**

**NEWSLETTER**

**March 2007**

**[www.ihpst.org](http://www.ihpst.org)**

### **CONTENTS**

- 1. 2007 IHPST Conference**
- 2. *Science & Education* Report**
  - (a) Volume 16, Number 1**
  - (b) Volume 16, Number 2**
  - (c) Volume 16, Numbers 3-5 (Leeds Conference Issue)**
  - (d) Journal on the Web**
  - (e) Manuscript Submission**
  - (f) Thematic Issues**
  - (g) 'Science, Worldviews and Education', special issue**
  - (h) 'Politics and Education', special issue**
- 3. NARST Conference: History, Philosophy & Sociology Strand**
- 4. Current Research**
- 5. Book Notes**

Comment by Abner Shimony on review of Eger, M.: 2006, *Science, Understanding and Justice: The Philosophical Essays of Martin Eger*,  
Tieszen, Richard. 2005: *Phenomenology, Logic, and the Philosophy of Mathematics*  
Lange, M. (ed.): 2007, *Philosophy of Science: An Anthology*

- 6. Publications for Sale**
- 7. Coming Conferences**
- 8. Future Newsletter Items**
- 9. IHPST Email List**

## 1. 2007 IHPST Conference, Calgary

### (a) *Organisation and Paper Submission*

The International History, Philosophy and Science Teaching Group will hold its *Ninth* Conference, at the University of Calgary, June 24 (evening) – 28 (noon), 2007

Conference Chair: Professor Ian Winchester (winchest@ucalgary.ca)

Conference Secretary: Linda Lentz (lentz@ucalgary.ca)

Programme Chair: HsingChi von Bergmann (ihpst07@ucalgary.ca)

The Conference Theme is: *Contextual Approaches to Science and Mathematics Teaching*

Calgary is about a two-hour drive from the Rocky Mountains and the delightful towns of Banff and Lake Louise. More details, including registration, travel, accommodation, and tourism options will shortly be available at the conference web site: [www.ucalgary.ca/ihpst07](http://www.ucalgary.ca/ihpst07).

Proposals (max.1,000 words) and Abstract (max. 150 words) need to be submitted as attachments to programme chair by **15<sup>th</sup> April 2007**. The files should be named: SURNAME\_proposal.doc and SURNAME\_abstract.doc.

### (b) *Springer Distinguished Lecture*

The Springer Distinguished Lecture will be given by Professor Garland Allen, School of Biology, Washington University, St Louis. He has published on topics in the history and philosophy of biology, and on the history of eugenics. The lecture will be concerned with how the history and philosophy of biology can assist pedagogical efforts to cultivate process skills in science and to illuminate science as a way of knowing.

### (c) *Scholarship Support*

The IHPST Group and the journal *Science & Education* have some small amount of money available to support the conference attendance of scholars from depressed economies. It is anticipated that this will be a maximum of USD1,500 from which the recipient will need to fund all their own travel, registration and lodging expenses.

Applicants are required to send one file as Word attachments to the IHPST secretary by April 15, 2007. It should be labelled SURNAME\_scholarship.doc.

This document should contain the following information:

NAME

INSTITUTIONAL ADDRESS (in full, for mail purposes)

EMAIL ADDRESS

BRIEF VITAE (list educational qualifications, teaching experience, publications or conference presentations, prior engagement with IHPST conferences)

CURRENT POSITION

SCHOLARSHIP IMPACT (give an account of how participation in the IHPST Calgary conference might be beneficial for the applicants own work and what flow-on effects it might have on their colleagues or local teachers.)

CALGARY CONFERENCE PROPOSAL (please insert, beginning on new page, the proposal that is being submitted to the Calgary Conference)

This scholarship application is to be submitted in parallel with the conference submission, it does not replace the need to submit to the conference by the closing date of April 15)

Please note that scholarship support will only be available for scholars who have had proposals submitted and accepted for the Calgary conference.

**(d) *Anticipated Contributors***

It is expected that about 200-250 educators, historians, philosophers, teachers, scientists and cognitive scientists from about 30 countries will engage with theoretical, curricular and pedagogical issues in contemporary science education.

Prospective participants are encouraged to contact colleagues and put together panels or symposia on these issues.

Among those that have indicated that they are preparing submissions for the conference are:

Jonathan Osborne, King's College London  
Ian Winchester, University of Calgary  
William McComas, University of Arkansas  
Igal Galili, The Hebrew University of Jerusalem  
Samson Nashon, University of British Columbia  
Steven Norris, University of Alberta  
Jesús Vázquez-Abad, Université de Montréal  
David Rudge, Western Michigan University  
Zoubeida Dagher, University of Delaware  
Robert Nola, University of Auckland  
Gürol Irzik, Bogazici University  
Andreas Quale, University of Oslo  
Ismo T. Koponen, University of Helsinki  
Mansoor Niaz, Universidad de Oriente  
Michael Ford, University of Pittsburgh  
Colin Gauld, University of New South Wales  
Norman Lederman, Illinois Institute of Technology  
Judith Lederman, Illinois Institute of Technology  
Michael Clough, Iowa State University  
Michael Matthews, Uni. of New South Wales  
Joanne Olson, Iowa State University  
Dana Zeidler, University of South Florida  
Arthur Stinner, University of Manitoba  
Don Metz, University of Winnipeg  
Stephen Klassen, University of Winnipeg  
Peter Heering, University of Oldenburg  
Fabio Bevilacqua, University of Pavia  
Steve Alsop, York University  
Kevin de Berg, Avondale College

Steve Alsop, York University  
Susan Barker, University of Alberta  
Larry Bencze, University of Toronto  
Michael Bowen, University of New Brunswick  
Karen Goodnough, Memorial University  
Samia Khan, University of British Columbia  
Jolie Mayer-Smith, University of British Columbia  
Barbara McMillan, University of Manitoba  
Olive Chapman, University of Calgary  
Bonnie Shapiro, University of Calgary  
HsingChi von Bergmann, University of Calgary  
Ronald G. Good, Louisiana State University  
Mick Nott, Kings College London  
Bharath Sriraman, University of Montana  
Clark Chinn, Rutgers University  
Don Howard, University of Notre Dame  
Robert Carson, Montana State University  
Calvin Kalman, Concordia College  
Stuart Rowlands, University of Plymouth  
Eric Scerri, University of California – Los Angeles  
Andoni Garritz, Uni. Nacional Autónoma de México  
Mariana Hagberg, Karlstad University  
Niklas Gericke, Karlstad University  
Patrice Potvin, Université du Québec à Montréal  
Kostas Skordoulis, University of Athens  
Wendy Sherman, Iowa State University  
Panos Kokkatos, University of Athens  
James Carifio, University of Massachusetts

## 2. *Science & Education Report*

The first five numbers (No.1, No.2, Nos.3-5) of Volume 16 (2007) of *Science & Education* have now been printed and will be mailed to subscribers by Springer Publishing.

### (a) **Volume 16, Number 1, 2007**

ERIC MICHAEL HOWE / Untangling Sickle-cell Anemia and the Discovery of Heterozygote Protection  
STUART ROWLANDS, TED GRAHAM, JOHN BERRY & PETER MCWILLIAM / Conceptual Change  
through the Lens of Newtonian Mechanics

JOSEP LUIS DOMÉNECH, DANIEL GIL-PÉREZ, ALBERT GRAS-MARTÍ, JENARO GUIASOLA,  
JOAQUÍN MARTÍNEZ-TORREGROSA, JULIA SALINAS, RICARDO TRUMPER, PABLO  
VALDÉS & AMPARO VILCHES / Teaching of Energy Issues: A Proposal for a Global  
Reorientation

IRENE ARRIASSECQ & ILEANA MARÍA GRECA / Approaches to the Teaching of Special Relativity in  
High School and University Textbooks of Argentina

T. V. VENKATESWARAN / Science and Imperialism: Content and Character of Natural Sciences in the  
Vernacular School Education in the Madras Presidency (1820-1900)

### (b) **Volume 16 No.2, 2007**

JOHN CARTWRIGHT / Science and Literature: Towards a Conceptual Framework

RICHARD GRANDY & RICHARD A. DUSCHL / Reconsidering the Character and Role of Inquiry in  
School Science: Analysis of a Conference

GÁBOR ÁRON ZEMPLÉN / Conflicting Agendas: Critical Thinking versus Science Education in the  
International Baccalaureate Theory of Knowledge Course

JOSÉ ANTONIO CHAMIZO / Teaching Modern Chemistry through 'Recurrent Historical Teaching  
Models'

### (c) **Volume 16 Nos.3-5, 2007 (Leeds Conference Issue)**

JONATHAN OSBORNE & MICK NOTT / Introduction

#### *Scientific Theory and Classroom Inquiry*

HARRY COLLINS / The Uses of Sociology of Science for Scientists and Educators

ANDREAS QUALE / Radical Constructivism, and the Sin of Relativism

PER-OLOF WICKMAN & BRITT JAKOBSON / Transformation through Language Use: Children's  
Spontaneous Metaphors in Elementary School Science

TERHI KATARIINA MÄNTYLÄ & ISMO T KOPONEN / Understanding the Role of Measurements in  
Creating Physical Quantities: A Case Study of Learning to Quantify Temperature in Physics Teacher  
Education

#### *History of Science and Science Teaching*

DON METZ, STEPHEN KLASSEN, BARBARA MCMILLAN, MICHAEL CLOUGH &  
JOANNE OLSON / Building a Foundation for the Use of Historical Narratives

STEPHEN KLASSEN / The Application of Historical Narrative in Science Learning: The Atlantic Cable  
Story

ATHANASIOS VELENTZAS, KRYSTALLIA HALKIA & CONSTANTINE SKORDOULIS / Thought  
Experiments in the Theory of Relativity and in Quantum Mechanics: Their Presence in Textbooks  
and in Popular Science Books

KOSTANTINOS TAMPAKIS & COSTAS SKOUDOULIS / The History of Teaching Quantum Mechanics  
in Greece

## *Teaching and Learning Biological Science*

KOSTAS KAMPOURAKIS & VASSO ZOGZA / Students' Preconceptions about Evolution: How Accurate is the Characterization as "Lamarckian" when Considering the History of Evolutionary Thought?  
PIERRE CLEMENT / Introducing the Cell Concept by both Animal and Plant Cells: A Historical and Didactic Approach

## *Science and Humanities*

IGAL GALILI & BARBARA ZINN / Physics and Art: A Cultural Symbiosis in Physics Education  
LENA HANSSON & ANDREAS REDFORS / Physics and the Possibility of a Religious View of the Universe: Swedish Upper-Secondary Students' Views  
KRISTINE HAYS LYNNING / Portraying Science as Humanism - A Historical Case Study of Cultural Boundary Work from the Dawn of the 'Atomic Age'

### **(d) Journal on the Web**

The journal *Science & Education* is now available on the web at: <http://www.springerlink.com/> (then PUBLICATIONS, then S, then 'Science & Education'), or more directly at:

The above articles, and all published articles since Volume One, 1992, and all articles that are currently accepted and 'in print', are available on the web via Springer's journal site: [www.springer.com/journal/11191](http://www.springer.com/journal/11191)

Or the articles can be accessed directly at:  
<http://springerlink.metapress.com/content/1573-1901/>

All articles can be downloaded as pdf files for free if the individual's institution subscribes to the relevant Springer journal package; otherwise they can be downloaded for a fee.

Alternatively subscription renewals for printed journals and new subscriptions (USD95 pa, with discount for students, retired faculty and scholars from depressed economies), can be effected at the IHPST web site: [www.ihpst.org](http://www.ihpst.org)

The Springer site is now linked to Google, and articles can be searched in Google by typing in author name and first words of title. This goes direct to the Springer site and the pdf file of the article.

Approximately 3,000 institutions around the world have subscribed to the on-line version of the journal, while many institutions have subscriptions to both print and on-line versions.

The on-line version is heavily used. In 2006 there were 23,584 article-downloads, an increase of one thousand over 2005 downloads. These figures make *Science & Education* one of the most down-loaded of all Springer education journals.

The web site provides many services to researchers:

- # The 'On Line First' section allows access to all accepted, forthcoming articles in the journal. As soon as an article is accepted for publication, a typeset pdf version of it is posted on the web and can be accessed by individual journal subscribers or by individuals whose institutions subscribe to a Springer package that includes '*Science & Education*'.

- # The Contents of each issue of the journal, back to Volume 1 Number 1 in 1992, are available. These can be downloaded by subscribers and individuals whose institutions subscribe to the journal. They are also available, at a cost, to non-subscribers.
- # Full details of the Editorial Board and Submission process are posted.

### **(e) Manuscript Submissions**

Scholars can submit manuscripts in file form direct to the journal at:

[www.editorialmanager.com/sced/](http://www.editorialmanager.com/sced/)

Thereafter they can check on its progress through the review process. Most submissions are reviewed by three senior scholars, usually involving a spread of educator, historian, philosopher or cognitive scientist. The submission site also has a guide to the journal's format and style conventions.

### **(f) Thematic Issues**

Since its inception in 1992 *Science & Education* has published thematic issues that bring together research articles on particular themes. These thematic issues have made a considerable contribution to advancing research in science education; a number of them have been overprinted and made available to non-subscribers, and some of them have been published as separate anthologies.

Previous thematic issues have included:

- 1994, 'Science and Culture', *Volume 3*(1).
- 1995, 'Hermeneutics and Science Education', *Volume 4*(2).
- 1996, 'Religion and Science Education', *Volume 5*(2).
- 1997, 'Philosophy and Constructivism in Science Education', *Volume 6*(1-2).
- 1997 'The Nature of Science and Science Education', *Volume 6*(4).
- 1999, 'Values in Science and in Science Education', *Volume 8*(1).
- 1999, 'Galileo and Science Education', *Volume 8*(2).
- 1999, 'Children's Theories and Scientific Theories', *Volume 8*(5).
- 2000, 'Thomas Kuhn and Science Education', *Volume 9*(1-2).
- 2000, 'Constructivism and Science Education', *Volume 9*(6).
- 2003, 'History, Philosophy and the Teaching of Quantum Theory', *Volume 12*(2-3)
- 2004, 'Science Education and Positivism: A Re-evaluation', *Volume 13*(1-2)
- 2004, 'Pendulum Motion: Historical, Methodological and Pedagogical Aspects', *Volume 13*(1-2, 7-8)
- 2006, 'Science Education in Early Modern Europe', *Volume 15*(2-4)

During 2007 and 2008 more thematic issues will be published, these include:

*Science Learning and Entertainment: From the 18<sup>th</sup> to the 20<sup>th</sup> Century* Jürgen Teichmann, Arthur Stinner & Falk Riess (editors) Volume 16 No.6

JÜRGEN TEICHMANN, ARTHUR STINNER & FALK RIESS / Historical and Pedagogical Perspectives on Entertainment, Popularisation and Learning in Science

FRITZ KUBLI / Teachers Should Not Only Inform but Also Entertain

OLIVER HOCHADEL / The Business of Experimental Physics: Instrument Makers and Itinerant Lectures in the German Enlightenment

MICHAEL ECKERT / Hydraulics for Royal Gardens: Water Art as a Challenge for 18th Century Science and 20st Century Physics Teaching

GUDRUN WOLFSCHMIDT / Popularization of Astronomy: From Models of the Cosmos to Stargazing  
LISSA ROBERTS / Devices Without Borders: What an Eighteenth-Century Display of Steam Engines can  
Teach us about 'Public' and 'Popular' Science  
CHRISTINE LEHMAN & BERNADETTE BENSUAUDE-VINCENT / Public Demonstrations of Chemistry  
in Eighteenth-Century France  
DANIEL RAICHVARG / Science on the Fairgrounds : From Black to White Magic  
IWAN RHYS MORUS / The Two Cultures of Electricity: Between Entertainment and Edification in  
Victorian Science  
MANFRED EULER / Revitalizing Ernst Mach's Popular Scientific Lectures  
DON METZ & ARTHUR STINNER / A Role for Historical Experiments: Capturing the Spirit of the  
Itinerant Lecturers of the Eighteenth Century  
KARIN REICH / Flatland - An Analogy between Mathematics and Physics  
PETER HEERING / Public Experiments and Their Analysis with the Replication Method

*Models in Science and in Science Education* Volume 16, Nos.7-8

IBRAHIM A. HALLOUN / Mediated Modelling in Science Education  
DEMETRIS PORTIDES / The Relation between Idealisation and Approximation in Scientific Model  
Construction  
ISMO T. KOPONEN / Models and Modelling in Physics Education: A Critical Re-analysis of Philosophical  
Underpinnings and Suggestions for Revision  
VASILIKI SPILIOPOULOU - PAPANTONIOU / Models of the Universe: Children's Experiences and  
Evidence from the History of Science  
FERNANDO FLORES-CAMACHO, LETICIA GALLEGOS, ANDONI GARRITZ & ALEJANDRA  
GARCÍA / Incommensurability and Multiple Models: Representations  
about Structure of Matter in Undergraduate Chemistry Students  
CIBELLE CELESTINO SILVA / The Role of Models and Analogies in the Electromagnetic Theory: A  
Historical Case Study  
MARIA DEVELAKI / The Model View of Scientific Theory and the Structuring of School  
Science Programmes  
NIKLAS MARKUS GERICKE & MARIANA HAGBERG / Definition of Historical Models of Gene  
Function and their Relation to Students' Understanding of Genetics

*The Teaching and Assessing the Nature of Science*, Michael Clough & Joanne Olson (editors)  
Volume 17 Nos. 2-3

MICHAEL P. CLOUGH & JOANNE K. OLSON / Teaching and Assessing the Nature of Science: An  
Introduction  
MICHAEL FORD / 'Grasp of Practice' as a Reasoning Resource for Inquiry and Nature of Science  
Understanding  
KEITH STEPHEN TABER / Towards a Curricular Model of the Nature of Science  
LAWRENCE SCHARMANN & MIKE U SMITH / A Multi-Year Program Developing an Explicit  
Reflective Pedagogy for Teaching Pre-service Teachers the Nature of Science by Ostention  
WILLIAM F. MCCOMAS / Seeking Historical Examples to Illustrate Key Aspects of the Nature of Science  
KEVIN DE BERG / The Concepts of Heat and Temperature: The Problem of Determining the Content for  
the Construction of a Historical Case Study which is Sensitive to Nature of Science Issues and  
Teaching-Learning Issues  
JIM RYDER & JOHN LEACH / Teaching about the Epistemology of Science in Upper Secondary  
Schools: An Analysis of Teachers' Classroom Talk

*Women, Feminist Theory and Science Education*, Cassandra Pinnick (editor) Volume 17 No. 4

CASSANDRA PINNICK / Persistent Absence: 'Methodological Feminism' and Women in Academic Science

SHARON CRASNOW / Feminist Philosophy of Science: 'Standpoint' and Knowledge

DIMITRI JORDAN GINEV / Hermeneutics of Science and Multi-Gendered Science Education

KRISTEN INTEMANN / Increasing the Number of Feminist Scientists: Why Feminist Aims Are Not Served by the Underdetermination Thesis

KRISTINA ROLIN / Gender and Physics: Feminist Philosophy and Science Education

ROBERT KLEE / The Alleged Importance of Being Tough, Really Tough A review essay of Christina Hoff Sommers and Sally Satel's, *One Nation Under Therapy: How the Helping Culture Is Eroding Self-Reliance*

The Contents of all the above issues can be viewed at the journal's Springer site, and articles can be downloaded by individuals whose institutions subscribe to the electronic version of the journal.

Other thematic issues to be published will include:

*Social and Ethical Issues in Science Education*, Dana Zeidler & Troy Sadler (editors)

*Studies in Historical Replication in Psychology*, Ryan D. Tweney (editor)

### **(g) Science, Worldviews and Education.**

This special issue will include papers from ten scholars from different backgrounds - philosophy, history, biology, physics, theology and education – addressing the important topic of 'Worldviews in Science and in Science Education'. This is a timely subject given that so much current discussion and debate is concerned with the putative 'Clash of Worldviews', and within that, the supposed clash of science and religion.

Hugh Gauch Jrn., Professor of Agriculture at Cornell University and author of *Scientific Method in Practice*, Cambridge University Press (2003) has written a 'position paper' for this issue that, among other things, details pronouncements by official scientific organisations on the question of whether science presupposes distinct worldviews; that is, whether the conduct of science requires specific epistemological and ontological commitments. The full text of the Gauch paper is available courtesy of the Springer 'Open Access' scheme at: <http://dx.doi.org/10.1007/s11191-006-9059-1> .

### **(h) Politics and Science Education**

'Politics and Science Education' a special issue of *Science & Education* is to be guest edited by Ron Good, Sherry Southerland and Peter Slezak.

CALL FOR PAPERS: Research papers are invited on the theme of the special issue. The following are some of the component topics that might be addressed.

1. Does the theory and practice of science education (ScEd) differ in different political and cultural systems?  
Is there anything distinctive about ScEd in Socialist states? Democratic states? Islamic states? Hindu states?
2. What can history tell us about the relationship between politics and ScEd?

Was there anything distinctive about Soviet Block East European or USSR or National Socialist Germany ScEd?

Has ScEd in China changed in form and content with change in Communist Party ideology and policy?

What lessons can be learnt from the 1960s 'Science for the People' movement?

Should ScEd take the shape of the last political foot that trode upon it?

3. What do books such as Chris Mooney's *Republican War on Science* (2006) or George Reisch's *How the Cold War Transformed Philosophy of Science* (2005) have to say re SCED and politics?
4. Is cognitive science and learning theory research in ScEd 'blind' regarding possible political impact on the theory and practice of ScEd?
5. Reappraising John Dewey's arguments about Democracy and ScEd?
6. How is the science curriculum affected by politics?
7. What, if any, are the constraints on science teachers advocating or promoting scientific knowledge that conflicts with dominant political, cultural or religious views?
8. What constitutes indoctrination in a science classroom? Did Thomas Kuhn advocate indoctrination into 'normal science'? Is indoctrination for 'good' causes acceptable in ScEd?
9. Any other historical, philosophical and sociological analyses that illuminate the connections between ScEd and the political context in which it is enacted.

Paper length ideally should be between 4-8,000 words, but more or less will be considered.

Submission date is September 1<sup>st</sup>, 2007. Further information can be obtained from Ron Good, or either of the other two guest editors:

Ron Good ([rgood@lsu.edu](mailto:rgood@lsu.edu))

Sherry Southerland ([southerl@mail.coe.fsu.edu](mailto:southerl@mail.coe.fsu.edu))

Peter Slezak ([p.slezak@unsw.edu.au](mailto:p.slezak@unsw.edu.au))

Submissions should finally be made to the journal's Springer site:

[www.editorialmanager.com/sced/](http://www.editorialmanager.com/sced/)

But early notification to Ron Good of manuscript title and abstract would be appreciated so as to allow better coordination of contributions to the issue.

### **3. NARST Conference: History, Philosophy & Sociology Strand**

The National Association for Research in Science Teaching (NARST, [www.narst.org/](http://www.narst.org/)) is holding its annual conference in New Orleans, April 15-17 2007. The programme is divided into different research strands, with Strand 13 being devoted to 'Historical, Philosophical and Sociological Studies'.

The following sessions are being held.

#### **Effects of Launching of Sputnik on Science Education in the United States**

- i. Effects of the Launching of Sputnik on Science Education in the United States:  
Preparing for the Golden Anniversary of Sputnik I Launch  
Catherine F. Wissehr, Jim P. Concannon, Lloyd H. Barrow

## **Epistemological Beliefs and Science Learning**

- i. : Information Commitments, Scientific Epistemological Views and Internet-Based Science Learning  
Chia-Ching Lin, Chin-Chung Tsai
- ii. Exploring Relations Between Scientific Epistemological Beliefs and Decision Making on a Socioscientific Issue  
Shiang-Yao Liu
- iii. Reflective Judgment & Nature of Science: Commonalities Explored  
Sharon Dotger
- iv. The Enhanced (E-DAST): A More Valid, Efficient, Reliable & Complete Method of Identifying Students' Perceptions of Scientists  
Donna L. Farland, William F. McComas

## **Historical Perspectives in Science Education**

- i. The NARST Academic Genealogy Project  
Mark J. Gagnon, Sandra K. Abell
- ii. A Historical Perspective of Conceptions of Chemistry Teaching Related to Amount of Substance Concept  
Kira Padilla, Carles Furió-Mas
- iii. A Study in History of Science Teaching by AIH (Anchored in History) Instruction  
Tzu Shan Cheng, Huey Por Chang
- iv. Joseph Priestley and the Enlightenment: Teaching Chemistry and the Cultural Contribution of Science  
Michael R. Matthews

## **Interactions of Teaching and Learning of the Nature of Science**

- i. Metaphysics as Physics: An Alternate Disposition for the Teaching and Learning Relationship in Science Education  
Douglas D. Arrow
- ii. Preservice Science Teachers' Nature of Science Instruction and Its Impact on Pupil Learning  
Ian C. Binns, Christine Schnittka, Douglas Toti, Randy L. Bell
- iii. Interactive Relationships Among Teachers' Intentions, Beliefs, Pedagogical Content Knowledge and Classroom Instruction on the Nature of Science  
Jenny Kwan, Siu Ling Wong
- iv. Towards a More Inclusive Account of Authenticity in School Science Inquiry  
Zoubeida R. Dagher

## **Investigating Textbooks for Coverage of the Nature of Science**

- i. Exploring Author-Editor-Publisher Perspectives and Interactions Regarding Representations of the Nature of Science in the Development of a Contemporary Science Textbook  
Maurice DiGiuseppe
- ii. Climbing Our Family Tree: The Untimely Birth of Children's Books About Evolution, 1920-1955  
Trevor J. Owens
- iii. Understanding Quantum Numbers in General Chemistry Textbooks  
Mansoor Niaz, Ramón Fernández

## **Nature of Science in Teacher Education**

- i. Effectiveness of a Discursive/Argumentation-Based History, Philosophy and Sociology of Science Program in Enhancing Teachers' Conceptions of the Nature of Science  
Meshach Mobolaji Ogunniyi
- ii. Across Content and Pedagogy: Seeking Consistency in NOS Instruction in Teacher Education Programs  
Deborah L. Hanuscin, Michele H. Lee
- iii. Professional Development for Teaching of the Nature of Science - What Works Best for In-Service Science Teachers?  
Siu Ling Wong, Man Wai Cheng, Benny H. W. Yung

## **Other Literature of Evolution/Creationism and a Serious Attempt at Its Application**

- i. The 'Other' Literature of Evolution/Creationism and a Serious Attempt at Its Application  
David F. Jackson, Leslie S. Jones, Norman Thomson, Joy Dike, Samuel O'Dell  
Raymond Freeman-Lynde

## **Perspectives on the Nature of Science**

- i. Supporting Elementary Teachers' Efforts to Teach Nature of Science Through Action Research  
Valarie L. Akerson, Deborah L. Hanson, Theresa A. Cullen
- ii. Prescription for the Classroom: Policy Actors' Conceptions of Science When Crafting the Scientifically-Based Research Guidelines in NCLB  
Brian P. Zoellner
- iii. Are Learners' Views of Nature of Science Content-Dependent? A Review of the Research  
Eun-Kyung Ko, Byoung-Sug Kim
- iv. Views on Evolution and Creationism: The Cases of Theology and Science Undergraduates in Korea

Seung-Urn Choe, Yumin Ahn, Miae Lee, Na-Hae Sung

- v. Investigating Undergraduate Atmospheric Science Students' "Ideas" about the Nature of Science  
Loran E. Carleton, Gerald H. Krockover

### **Role of Cultural Practices on Teachers' Views on the Nature of Science**

- i. Investigating Toxic Risk and Sharing Results Online: What Do Preservice Science Teachers Know about Science, Inquiry, and Literate Practices?  
Julie A. Bianchini, Emily Kang, Gregory J. Kelly
- ii. Science Teachers' Inspiration for Teaching SSI: A Gap With Reform Efforts  
Hyunju Lee, Klaus Witz
- iii. The Relationship of Cultural Values, Intellectual Levels and Preservice Teachers' Views of Nature of Science  
Valarie L. Akerson, Cary A. Buzzelli, Lisa A. Donnelly

### **Students' Conceptions of the Nature of Science**

- i. Turkish College Biology Students' Acceptance of Evolution  
Deniz Peker
- ii. Students' Beliefs in Pseudo-Science  
Mats Lundström
- iii. Improving Reflective Judgment in High School Students Through Socioscientific Issues  
Dana L. Zeidler, Brendan E. Callahan, Karey Burek, Troy D. Sadler, Scott Applebaum
- iv. A Change in Perspective: Science Education Graduate Students' Reflections on Learning About NOS  
George V. Akom, Renee S. Schwartz, Brandy Skjold, HangHwa Hong, Fang Huang, Robert E. Kagumba

### **Teachers' Conceptions of the Nature of Science**

- i. Explicit/Reflective Approach to Enhance Pre-Service Science Teachers' Understanding of the Nature of Science Concepts  
Behiye Bezir Akcay, Hakan Akcay
- ii. A Study on Prospective Teachers' Beliefs About the Nature of Science and Self-Efficacy  
Bilge Can, Esin Perkmez
- iii. Scientific Modeling for Inquiring Teachers Network (SMIT-N): The Relationship Between Elementary Teachers' Views of Scientific Modeling and Nature of Science  
Orvil L. White, Valarie L. Akerson, Huseyin Colak, Khemmedwadee Pongsanon

## **Views of the Nature of Science from Biology, Philosophy /Theology, Pre-service Instruction, International Perspectives, Scientists, and a (Kansas) Classroom Teacher**

- i. Views of the Nature of Science from Biology, Philosophy /Theology, Pre-Service Instruction, International Perspectives, Scientists, and a (Kansas) Classroom Teacher  
Lawrence Scharmann, Mike U. Smith, Jonathan Osborne, George Griffith

## **Symposium on Inquiry and the Learning of Science Theories and Practices**

- i. Inquiry and the Learning of Science Theories and Practices  
Richard Duschl, Nancy Brickhouse, Fouad Abd-El-Khalick, Philip Bell  
Daniel C. Edelson , Richard Grandy

## **4. 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.: 2006, 'Facilitating Chemistry Teachers' Understanding of Alternative Interpretations of Conceptual Change', *Interchange* **37**, 129-150.
- Niaz, M.: 2006, 'Can the Study of Thermochemistry Facilitate Students' Differentiation between Heat Energy and Temperature', *Journal of Science Education and Technology* **15**, 269-276.
- Mamlok-Naaman, R., Ben-Zvi, R. & Hofstein, A., Menis, J., & Erduran, S.: 2005, 'Influencing Students' Attitudes towards Science by exposing them to a Historical Approach', *International Journal of Science and Mathematics Education* **3**(3)
- 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.
- Niaz, M.: 2005, 'An appraisal of the controversial nature of the oil drop experiment: Is closure possible?', *British Journal for the Philosophy of Science*, **56**(4), 681-702.
- 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.
- Dagher, Z., & BouJaoude, S.: 2005, 'Students' Perceptions of the Nature of Evolutionary Theory', *Science Education* **89**(3), 378-391.
- Nola, R. & Irzik, G.: 2005, *Philosophy, Science, Education and Culture*, Springer, Dordrecht.
- Ben-Ari, M.: 2006, 'Whose Final Hour? The Problem of Naive Egocentric Catastrophism in Doomsayers and Catastrophists', *Skeptic* **12**(3), 2006, 40-49.

Waters-Adams, S.: 2006, 'The Relationship between Understanding the Nature of Science and Practice: The Influence of Teachers' Beliefs about Education, Teaching and Learning', *International Journal of Science Education* **28**(8), 919-944.

Smith, C.L. & Wenk, L.: 2006, 'Relations among Three Aspects of First-Year College Students' Epistemologies of Science', *Journal of Research in Science Teaching* **43**(8), 747-785.

## 5. Booknotes

*Comment on Review of Martin Eger's Science, Understanding and Justice.* IHPST Newsletter, December 2006 (available at [www.ihpst.org](http://www.ihpst.org) under 'newsletters')

The reviewer criticizes Eger for failing to respond to criticisms made by Wallis Suchting (in *Science & Education* **4**, no. 2, 1995) of three articles by Eger printed in the same journal in 1992-3 and reprinted as articles 1,2, and 17 in the volume reviewed. Since I, as editor of Eger's papers, was unaware of Suchting's criticism I also had no information about Eger's abstention from replying. But I believe that the reason is evident from the reviewer's comment: "Suchting begins by probing Eger's, and the hermeneutic tradition's, claim that the meaning of a text 'arises' or 'emerges' from the act of interpretation....Suchting rightly asks how, given hermeneutical principles, can one possibly judge the correct interpretation from all potential ones? The only alternative is to say there are no correct interpretations, which again amounts to Relativism." In this passage Suchting is assuming first that the hermeneutic tradition is monolithic, and second that Eger is fully committed to that tradition. He thereby neglects Eger's historical review of the evolution of hermeneutics and Eger's own variant of this mode of philosophising.

Hermeneutics originated in the nineteenth century as a technique for understanding written texts (p. 8 of the book) and was generalized to philosophical hermeneutics (Heidegger and Habermas et al.), according to which "language ...ought not be understood merely as an instrument of communication but as a collective field, a tradition, from *within which* we see whatever we see" (p.10). This philosophy gives rise to "the hermeneutic circle," permitting the conclusion that "multiple interpretations can coexist, and no test can really *decide* among them" (p.12). This is the hermeneutics to which Suchting was objecting.

But there was a further evolution in the "ontological turn" of Gadamer, according to which "the foregoing sketch of the reading of a text, of 'the circle', and of the fore-structure of knowledge, must not be taken as a description of *knowing* by a subject but as a description of *being* in a mode that is peculiarly human" (p.14). This kind of hermeneutics "repudiates outright any suggestion of totally closed-off worlds" (p.17). Each language user has a "horizon", which Gadamer defines as "the range of vision that includes everything that can be seen from a particular vantage point" (p. 17). Horizons, moreover can overlap and fuse, and can be drawn into fusion by deliberate engagement in dialogue (p. 18). This version of hermeneutics, therefore, does not support the thesis of "incommensurability" of competing scientific languages but offers an alternative to incommensurability.

Eger explicitly amplifies Gadamer's version of hermeneutics by citing the testimony of the experimental geneticist Barbara McClintock about the phenomenology of scientific observation: "I know every plant in the field...I have learned so much about the corn plant that when I see things, I can interpret [them] right away" (quoted on p. 19). "I found that the more I worked with them [chromosomes] the bigger and bigger they got, and when I was really working with them I wasn't outside, I was down there, I was part of the system" (quoted on p. 20).

Eger's citation of McClintock effectively modifies Gadamer's version of hermeneutics into a realistic epistemology resembling those of two philosophers who were both *realistic* in their acknowledgment of an external world existing independently of the knower and *idealistic* in their treatment of the relation of entities in nature to the human mind, namely C.S. Peirce and A.N. Whitehead. In his triadic phenomenology Peirce includes the category of Secondness: "We have a

two-sided consciousness of effort and resistance, which seems to me to come tolerably close to a pure sense of actuality. On the whole, I think we have here a mode of being of one thing which consists in how a second object is. I call that Secondness” (*Collected Papers*, vol. I, Harvard U. Press, 1931, sect. 24. Whitehead recognizes a kind of direct experience which he calls “perception in the mode of causal efficacy” (*Process and Reality*, Macmillan, 1926). The connection which both philosophers propose between human cognition and the objects of cognition simultaneously naturalizes the former and endows the latter with proto-mental features.

When Eger cites McClintock’s testimony as epistemologically veridical, he is implicitly enriching hermeneutics, even Gadamer’s, with philosophical theses reminiscent both of Peirce, whom he cites on several occasions, and Whitehead, whom he does not but could cite.

One could reasonably object to Eger’s appeal to McClintock’s testimony on the ground that she is reporting actual experience when she talks of the macroscopic corn plant, but that she is improperly conflating biophysical theory with direct experience when she claims “to see the internal parts of the chromosomes.” Eger is justified, however, in tacitly accepting her conflation because of another important modification which he makes of hermeneutic philosophy: this is his recognition, on the basis of two magnificent episodes in the history of science, of the epistemic reliability of a sustained and careful application of the hypothetico-deductive method.

The first episode is treated in Article 3, “Achievements of the Hermeneutic-Phenomenological Approach to Natural Science: A Comparison with Constructivist Sociology.” This article summarizes the argument in *The Golem* by Collins and Pinch that the experimental counting rate of neutrinos arriving at detectors on earth contradicted the conventional account of the production of neutrinos in the core of the sun, a contradiction which scientists tried to explain away by “negotiation” instead of candidly conceding the falsification of an accepted theory. Eger then summarizes the later history of this dispute, in which it transpired that a considerable fraction of the type of neutrinos registered by the detectors were lost in transit from the sun because of transitions to another “flavor” of neutrino not registered by these detectors; and the possibility of this transition could be explained by hypothesizing that neutrinos are not massless, contrary to earlier theory. Not only did the initial contradiction evaporate under a more refined and sustained application of the hypothetico-deductive method, but elementary particle theory was transformed and made more subtle.

The second episode, presented in article 6, “Meaning and Contexts in Physics”, recounts the success by Charles Darwin’s son George in answering Lord Kelvin’s serious objection that the earth had not endured long enough to permit the evolution of the known biodiversity. Essential to George Darwin’s answer was the great increase of the estimate of the age of the earth by taking into account heating of its interior by radioactive decay. Both of these episodes support the thesis that the hypothetico-deductive method, carefully employed, can reliably supplement direct observation in explanations of natural processes. McClintock’s statement about “seeing” the chromosomes is an intellectual fusion of direct observation (sharpened by intimate familiarity with theoretical models) with hypothetico-deductive inference. Gadamer’s “fusion of horizons”, thus modified, is a wonderful psychological process combining sensory data, internalization of theories, and imagination.

The reviewer has failed to recognize an immense virtue of Martin Eger’s book: that he not only learned from hermeneutic philosophy but enriched it by reflecting on the actual practice of the natural sciences.

*Abner Shimony*, Professor Emeritus, Departments of Philosophy and Physics, Boston University.

Reply to Comment by Professor Shimony.

I am very grateful, as I am sure readers will be, for Abner Shimony’s brief elaboration of the different strands within the Hermeneutical Programme, and the manner in which he connects Martin Eger’s thought to these strands.

Let me remind readers of the conclusion of my brief review of Abner's collection of Eger's articles:

Readers of the Collection will certainly be impressed with Eger's breadth of knowledge, his engagement with philosophical issues in science, and his serious concern with the improvement of science teaching. It can only be regretted that someone who took Dialogue in science, philosophy and education so seriously did not engage with Suchting's clearly stated critique of the entire hermeneutical programme. To have done so, and especially to have satisfactorily defended his arguments, would surely have made his subsequent arguments clearer and stronger.

Abner's foregoing Comment is just such an engagement with Suchting's criticisms of the hermeneutic programme.

*Michael R. Matthews*, School of Education, University of New South Wales

Tieszen, Richard. 2005: *Phenomenology, Logic, and the Philosophy of Mathematics* Cambridge University Press, Cambridge.

The common separation of philosophy into Analytic and "Continental" traditions obscures the fact that in its early days the latter tradition was as concerned with mathematics, logic and the natural sciences as the former, and discussed many of the same problems. The neglect of mathematics and science by more recent philosophers in the "Continental" tradition, and in some cases their embarrassingly ignorant statements about them, are a recent degeneration, not an intrinsic part of their approach.

Richard Tieszen has published an impressive volume of work over the last twenty years attempting to redress the balance by reviving the phenomenological approach of Husserl to the philosophy of mathematics. This collection of fifteen papers shows that Husserl would have had interesting things to say about many of the developments which occurred after his death. Husserl's position is approached from his work on arithmetic and logic. Other essays consider works by Quine, Maddy, Penrose, the intuitionists, Weyl, Poincaré, and Frege, and the significance of Gödel's undecidability results from a Husserlian position.

Several essays focus on the neglected topic of Gödel's interest in phenomenology and will be of interest to his biographers, and also to historians and philosophers of mathematics.

*Jim Mackenzie*, Faculty of Education and Social Work, University of Sydney

Lange, M. (ed.): 2007, *Philosophy of Science: An Anthology*, Blackwell Publishing, Oxford. ISBN 10-1-4051-3034-2. 650 pps.

This collection contains 38 articles divided into nine sections: Logical Empiricist Heritage, Logical Foundations of Belief Revision, Criteria of Theory Choice, Realism, Scientific Explanation and Laws of Nature, Natural Kinds, Singular Causation, Causal Laws, Metaphysical Implications of Modern Physics. The editor, Marc Lange, provides a long and informative introduction to each section of readings.

The papers range from 1945 to 1998. Among the authors are a good many of the 'Whos Who' of late twentieth century philosophy of science: Carl Hempel, Wesley Salmon, Nelson Goodman, Clark Glymour, Ian Hacking, Elliott Sober, Nancy Cartwright, Larry Laudan, and Hans Reichenbach. The editor has chosen the papers because he believes that 'Great philosophy papers, like great literature, are not left behind as our understanding advances. They always have more to teach us.' This is true of every paper in the collection. For instance Hempel's 1958 paper 'The Theoretician's Dilemma' is included. Hempel here sets out clearly a dilemma that all theorists in science and social science should confront and work through: Theoretical terms either link

observable phenomena and thus can be eliminated in favour of empirical laws, or they fail to link observable phenomena, and thus should be eliminated as useless. To follow through Hempel's unpacking of this dilemma is educative for each generation.

The collection is more suited to upper-level philosophy students and to advanced scholars, it is not a collection for beginners.

## 7. Publications for Sale

The following publications can be ordered from the IHPST Group at [www.ihpst.org](http://www.ihpst.org) :

- #1 *CD Proceedings of the 6<sup>th</sup> IHPST Conference, Denver, 2001*, 100 papers, W. McComas (ed.), USD10.
- #2 *CD Proceedings of the 7<sup>th</sup> IHPST Conference, Winnipeg, 2003*, 100+ papers, D. Metz (ed.), USD10.
- #3 *Science Education and Culture*, F. Bevilacqua, E. Giannetto & M.R. Matthews (eds.), Kluwer, 2001, 362pp, USD20.
- #4 *Science & Education* journal Volume 2, 1993, 382pp, USD10.
- #6 *Science & Education* journal Volume 12, 2003, 808 pps, USD20.
- #7 *Science & Education* journal Volume 13, 2004, 820 pps, USD20.
- #8 *The Pendulum: Scientific, Historical, Philosophical & Educational Perspectives* (Michael R. Matthews, Colin Gauld & Arthur Stinner (eds.), Springer, 2005, USD20

## 7. Coming Conferences

March 15-19, 2007. Philosophy of Education Society (PES) Conference, Atlanta. Details at: <http://philosophyofeducation.org/>

April 9-13, 2007. American Educational Research Association (AERA) Conference, Chicago. Details at: <http://www.aera.net/>

April 14-17, 2007. National Association for Research in Science Teaching (NARST) Conference, New Orleans. Details at: <http://www.narst.org/>

June 24-28, 2007. 9<sup>th</sup> IHPST Conference, Calgary. Details at: [www.ucalgary.ca/ihpst07](http://www.ucalgary.ca/ihpst07)

October 5-7, 2007. 4th Hellenic HPS&ST conference, Patras. Details from: Dr Dimitris Koliopoulos, [dkoliop@upatras.gr](mailto:dkoliop@upatras.gr)

## 8. Future Newsletter Items

This IHPST Electronic *Newsletter* goes to 1,300 email addresses on the IHPST list, and it is also posted to various science education, philosophy of education and HPS lists. Items for inclusion in the *Newsletter* are appreciated. These can be items for the 'Recent Research', 'Recent Books', 'Books' or 'Conferences' sections. Brief Book Notes are especially welcomed.

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

A/Professor M.R. Matthews, School of Education, UNSW, Sydney 2052, Australia  
Email: [m.matthews@unsw.edu.au](mailto:m.matthews@unsw.edu.au)

## **9. IHPST Email List**

The email list is used sparingly, perhaps once a month, to send group information such as contained in this Newsletter. It is a closed list, not an open 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](mailto: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](mailto:majordomo@explode.unsw.edu.au) . In the body of the message, not the subject line, simply write: 'subscribe ihpst-group'.