On the third branch

Colin Upstill

Computers in Physics. Editor Robert R. Borchers. *American Institute of Physics*. 6/yr. US \$125, Canada and South America \$135, elsewhere \$140 (institutional); US \$25, Canada and South America \$35, elsewhere \$40 (individual).

IN the distant past, physics was thought of as a branch of philosophy, and the behaviour of the physical world was understood purely by theorizing about it. The computerization of physics today is a revolution of similar magnitude to the experimentalization of physics that took place around the time of Galileo. In the history of physics, the 1980s will be remembered neither for high-temperature superconductivity, nor for cold fusion, but as the decade in which computers really entered the methodology of physics.

Computers in Physics is an interdisciplinary periodical based on the recognition that a third branch of science is rapidly developing. It also tries to combine learned journal with magazine, juxtaposing peer-reviewed archival papers with news, views and feature articles. Most of the latter are excellent, but the quality of the research papers is less certain: some are introductory, some expository, and few contain much that is really novel.

The range is vast. In early issues, subjects dealt with include expert systems, computer algebra, supercomputer algorithms, particle physics codes, colour vision, the fractal dimension of cerebral surfaces, seismic tomography, computer architectures, parallel processing (highly relevant, as so much computing in physics needs supercomputer performance), optical computing, neural networks, the physical limits of computing (physics is as unavoidable within the machines as the machines are in physics), and software construction methods. It is especially good to see coverage of this last topic — unlike chemists, physicists tend to write their own code, and are usually self-taught, with bad or even dangerous habits.

After an initial hiccup — there is but one paper, six pages long, in the 96 pages of the third issue — *Computers in Physics* has settled down to being almost exactly half magazine and half journal. There are regular columns on numerical recipes, simulations, computers in physics education and spreadsheets. Spreadsheets can be used for purposes far beyond their original applications in accounting, and offer a remarkable capability for quick and easy solutions to a broad range of scientific problems; sharp instruments cut

both ways, however, and these programs can provide the unwary with pretty collections of incorrect answers.

There is a fair amount that is good about *Computers in Physics*, and much that is mixed. The papers have lots of program listings in them, but many lines are irrelevant to the technical content of the paper; language-independent pseudo-code or flow diagrams are far better, and happily these have started to appear in the most recent issues. Colour is heavily used, but in the journal section it is largely negated by complicated pictures being reproduced at the size of postage stamps.

The articles and papers have a reasonably international authorship, though with a decided US bias which is both understandable and acceptable. Yet apart from a couple of brief references to parallel-processing activities in Europe and to Japanese supercomputers (and in terms which imply 'the threat from'), the news pages are almost entirely US-orientated. In consequence the international appeal is considerably diminished, as is the value of

the periodical to its US readers. Another failing is that there is no obvious distinction between the magazine and journal pages. To be concerned at this is not elitism — the boundary conditions on an author are different for magazine articles and for peer-reviewed papers, and the extent to which another researcher can rely on each varies accordingly.

Communications of the ACM, *Computer* and *IEEE Software* have most of the good points of *Computers in Physics*, such as colour illustrations, and cover between them its computing aspects. With *American Journal of Physics* or *European Journal of Physics* for more pedagogical papers, and the established physics literature for specific applications, the considerable range of *Computers in Physics* is already well catered for. The question is whether or not it is worthwhile to have such diverse material in one place. I rather doubt it. □

Colin Upstill is with Plessey Research, Roke Manor, Romsey, SO51 0ZN, UK.

Also submitted for review

The following list shows the journals that were eligible for review but that are not covered in the preceding pages. It does not include those titles that had not published enough issues to be considered (see page 350).

Acta Geologica Sinica (Geological Publishing House, Beijing, distributed by Pergamon).

Acta Meteorologica Sinica (China Meteorological Press, Beijing, distributed by Pergamon).

American Journal of Hypertension: Journal of the American Society of Hypertension (Elsevier).

APMIS (formerly *Acta Pathologica, Microbiologica et Immunologica Scandinavica*) (Munksgaard, Copenhagen).

Australian Systematic Botany (CSIRO/Australian Academy of Science, East Melbourne, Victoria).

Cellular Signalling (Pergamon).

Chinese Journal of Atmospheric Sciences (Allerton, New York).

Chinese Journal of Infrared and Millimeter Waves (Allerton, New York).

Clinical Microbiology Reviews (American Society for Microbiology).

Experimental Thermal and Fluid Science: International Journal of Experimental Heat Transfer, Thermodynamics, and Fluid Mechanics (Elsevier).

International Journal of Numerical Modelling: Electronic Networks, Devices and Fields (Wiley).

Journal of Planar Chromatography — Modern TLC (Hüthig).

Journal of Food Composition and Analysis: An Official Publication of the

United Nations University International Network of Food Data Systems (Academic).

Journal of Human Nutrition and Dietetics: The Official Journal of the British Dietetic Association (Blackwell Scientific).

The Journal of Trace Elements in Experimental Medicine (Alan R. Liss).

Microbial Ecology in Health and Disease (Wiley).

Microwave and Optical Technology Letters (Wiley).

Muon Catalyzed Fusion: Journal Devoted to Theory and Experiment in μ CF and Its Applications, Mesic Atomic and Molecular Physics (Baltzer, Basel).

The National Medical Journal of India (All India Institute of Medical Sciences, New Delhi/Oxford University Press).

Nuclear Geophysics: A Journal of Nuclear Techniques in the Earth and Environmental Sciences, Minerals Exploration, Mining and Process Control (Pergamon).

Pigment Cell Research (Alan R. Liss).

Reproductive and Genetic Engineering: Journal of Feminist Analysis (Pergamon).

Reproductive Toxicology (Pergamon).

Resources, Conservation and Recycling (incorporating *Resources and Conservation and Conservation and Recycling*) (Elsevier/Pergamon).

Schizophrenia Research: An International Multidisciplinary Journal (Elsevier).

Soviet Journal of Applied Physics: Thermophysics, Heat Transfer, Plasma Physics, Protective Coatings, Fluid Dynamics, Cold Climate Engineering (Scripta Technica, a subsidiary of Wiley).