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**Editorial: Synthesis and analysis, interdisciplinarity and foundations.**

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First of all, I want to pay tribute to the former Editors of this journal, Ryszard Wojcicki and Paul Humphreys. I am very proud to continue the initiative that they undertook, and I will do my best to guide *Foundations of Science* further on the road that they began.

This summer I met an old friend who boldly asked me the following question: 'Has your life become, like mine, more algorithmic?' The question struck me, because I knew what he meant, and we laughed heartily at the sudden flash of mutual understanding. Indeed, we live in a busy time full of change. Old stable traditions and reference systems are fleeing, and the information explosion confronts us each day with something new and seemingly important. Also, the originally more reflective attitude of the working scientist does not escape this turbulence. He or she has to publish rapidly (or will perish) and accumulate as many new results as possible in a short time. He or she has to participate many times a year in the national and international roulette of projects, proposing many and obtaining few, depending on a multitude of uncontrollable factors. He or she has to manage a group or centre of researchers, and thereby is automatically engulfed in all the complicated aspects of 'professional management'. Besides dealing with this super multitask, and indeed (as my friend so aptly put it) this increasing algorithmic environment, the scientist's main vocation must and should remain 'participation in the great endeavour of Science'.

And here we are confronted with an apparent paradox. Science itself seems more dispersed than ever, in that a multitude of different disciplines, with seemingly incompatible methodologies, study and analyse fragments of knowledge that at first sight appear completely unrelated. The many new findings that come toward us with accelerating speed are often so complex and contextual that it seems almost impossible to integrate them into a harmonious whole. In spite of this state of confusion and intellectual hesitation, however, humankind has never been confronted with the revelation of a view that is so grand, magnificent, and surprising. Cosmology aims at a model of the evolution of the whole universe; the galaxies, the stars, the planets, and even our blue planet earth have been attributed their specific place in this model. The chemical world, and even parts of the biological world, have been founded by 'quantum physics'. The animate has been linked for the first time in a deep way with the inanimate. We understand the origin of the species and, in part, the origin of humankind. Some aspects of human consciousness have been

unraveled; we are starting to 'know how we know'. Out of this collective enterprise, a new, more integrated world view is emerging, a world view that is starting to shed light on many of the profound and fundamental questions that humankind has been asking for thousands of years: What is the nature of reality? What do we know about the origin of life? What is the origin of the universe? What is the role of humanity in all this? What can we say about 'good' and 'bad', and about 'beauty' and 'ugliness'? How can we act in the world and what are the consequences and results of our actions? How can we know?

At the verge of the third millennium it is perhaps time for us scientists to lay back, breath deeply, balance and centre, and consciously develop and explicate this synthetic view. I hope and I certainly wish that Foundations of Science, as a journal, will play a role in this activity. For this reason, articles that are inspired by an attitude of deep reflection and synthesis will be particularly welcome for publication in Foundations of Science.

But synthesis must go hand in hand with in depth analysis. Interdisciplinarity may not be an excuse for vagueness and pure speculation. Scientists that engage in interdisciplinary research must accomplish the difficult task of correctly using results obtained through deep and fine analysis by specialists in the different scientific disciplines. We seem to stand here for an insurmountable task. How can one individual be a specialist in the different scientific disciplines that are often necessary for interdisciplinary research? With the enormous increase of scientific knowledge within specific disciplines, this indeed seems to be impossible. Good and well-structured scientific collaboration of specialised scientists is the only way. We believe that this is the first time this type of interdisciplinary collaboration is indispensable. A journal as Foundations of Science could play an essential role. Well-written papers about fundamental aspects of specialised fields of knowledge are essential to the type of interdisciplinary collaboration to which we refer. Therefore, articles that concentrate on new, detailed results of fundamental importance within a specific scientific discipline, written by a specialist in this discipline, not necessarily aiming at synthesis, are also very welcome in the journal.

Since Foundations of Science, for reasons just explained, is directed towards researchers active in a variety of different disciplines, I would like also to give some thought to the form of the presented papers. It would be best if papers situated within one discipline are made accessible to scientists working in another discipline. This will of course necessitate special considerations on the part of the author. Papers presenting new ideas can be of an advanced or complex nature, and use fully the technical jargon from a specific scientific discipline. However, in order to maintain cross-disciplinary accessibility, they should best follow some guidelines that I would now like to clarify.

I propose that papers requiring the reader to have in-depth exposure to the advanced technical tools of a specific discipline consist of two complementary parts.

A first part, addressed explicitly at a multidisciplinary audience, that contains mainly the following material:

- (a) Situation of the problem within the context of the problem domain. Ample space may be used for this description of the context.
- (b) Extensive reference to the classical and accepted views.
- (c) A clear, critical statement of how the (new) approach or result confirms or questions existing results.
- (d) A summary in non-technical language of the results described in the second part of the paper.

This first part of the paper should best be written so as to be accessible to scholars working in other disciplines. Often, the whole can be made more understandable by discussing the matter on a meta-level, explaining explicitly what is understood, why and how it is understood, what is not understood, and, if possible, why and how it is not understood. This means that papers containing completely new and 'not-yet-understood' matter are also welcome. But in that case, the first part should make it clear that the problem's present status is 'not-understood', and explain why it is nevertheless of scientific importance.

The second part of the paper, addressed to a specialised audience, should contain a detailed, formal exposition of the matter, using the technical tools and jargon of the discipline. This exposition should be as self-contained as possible. This means that also explanations about the techniques and the jargon may be included (if they have not yet been included in the first part). A high degree of self-containment can also be achieved by including references to good quality expository papers within the field.

With this double focus, Foundations of Science strives to achieve the dissemination of fundamental results from one scientific discipline to another, while maintaining an advanced level of discussion.

I also want to announce a specific action of Foundations of Science. The journal will incorporate 'invited papers' to elaborate an archive that will be called the 'Third Millennium Archive'. For this archive, Foundations of Science will invite scholars of different scientific disciplines to write a special invited paper. The idea is that the Third Millennium Archive collects papers of fundamental importance containing crucial material about the state of affairs of our world on the verge of the third millennium. The aim of the archive is to invite scientists to work out the most important fragments of knowledge about the nature of reality and ourselves. The papers of this archive will be published in a special section appearing apart in each volume of the journal.

Foundations of Science will continue the publication of special issues consisting of papers solicited by the guest editor(s). Scientists who are interested in guest editing a topic issue of Foundations of Science are kindly requested to send me their proposal. The proposal should contain a presentation of the main ideas and problems to be discussed in the proposed issue. This should be written in the form of a note which might be published in the journal before the special issue appears.