

Editorial

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This issue brings you some of the insights of the renowned mathematician, John Nash and their impact in many areas. There is a biographical note, one piece on the role of his ideas in engineering design, one on their role in biology, and one more taking up the challenging task of explaining one of his most famous theorems. Nash captured the public imagination for his path-breaking work, but even more for the strange circumstances of his life and how it ended. As these fade into history, we can reflect on the wider role of mathematics in the 21st century. It is ironic that a discipline born of the most basic concerns of human civilization is regarded by many as esoteric and inaccessible!



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Evidence indicate that the Babylonian civilization was keeping careful accounts, not just of money and goods but the movements of the sun, the moon and the planets, four thousand years ago. A clay tablet dated 1830 BCE has the square root of 2 up to six significant figures! One can only speculate as to what impulses drove anyone to think about and calculate something which could not have been of any direct use at that time. The practitioners of mathematics in that era might have been viewed with the same awe as now – they were priests, astrologers, and astronomers, a microscopic minority interpreting the heavens to the majority. Today, mathematics is learnt and practiced much more widely. At *Resonance*, we try to contribute to wider understanding and appreciation of mathematics, with articles on its many facets. But we are well aware that there is much more to be done to make this subject more accessible. We need to reach out to a wider audience, at least at the level of appreciation. After all, how many of us who listen to and enjoy music can produce it? Mathematicians would claim that their subject has its own music. Certainly, many of them are as interesting personalities as our musicians.



Another of our articles in this issue deals with the physics of the nuclear reactor. It is interesting to note that that something which was a top secret seventy years ago is now assigned as a problem to Olympiad students aged eighteen or less. Homi Bhabha, (*Resonance*, Vol.3, No.7, 1998) saw nuclear energy as a key ingredient of national development, as early as 1948. In the years that have passed, public sentiment around the world has swung in the opposite direction. The accidents at Chernobyl in Belarus, and Fukushima in Japan, caught worldwide attention and undoubtedly contributed to the current wave of anti-nuclear feeling.

But our appetite for energy seems to be insatiable. The current alternative, coal, needs to be examined as rigorously. It is true that coal mining and burning do not result in such devastating accidents. But there is a steady stream of smaller accidents in coal mines taking their toll. Even when there is no accident, the miner's health is far from optimal. Let us also account for the particulate matter which clogs the lungs of those who live near coal-fired plants, the acid rain, and the steady buildup of carbon dioxide in the atmosphere, with consequent global warming. Can we still afford to ignore the nuclear option? I would argue that it deserves serious re-examination, at least as a transition to a future era when solar energy meets all our needs. This could be by direct conversion into electricity or by splitting water to obtain hydrogen, the cleanest possible fuel. In contrast to nuclear fission, energy from nuclear fusion is a still a distant dream, now claimed to be thirty years away. It is sobering to realize that mid twentieth century visionaries, Bhabha included, gave the same thirty year figure in 1955! Fusion advocates need not despair. Solar energy is fusion energy.

It is a relief to turn from defending two unpopular subjects- mathematics and nuclear energy- to the world of flowering plants. Plants made our planet suitable for all other forms of life, and continues to make our planet livable and beautiful. Let us celebrate them!

