were a new country. . . . The mind, the labour, and the energies of the forebears were occupied for two hundred years with immediate problems of conquering a country and holding dominion over it. The inventive genius of our people was challenged to produce new and swifter means of transportation and communication as well as labour-saving devices to accomplish this prodigious task. The inventive capacities and technological skills of America were stimulated to a fever heat' (emphasis added).

Subsequently, however, for reasons mentioned below, the Americans succeeded in establishing a lead in basic research without aiming at commercial gains. Our concern, though for a much less ambitious target, is qualitatively the same today – to ensure international levels in our S&T activity, lest we succumb hopelessly to market forces generated elsewhere without building our own capability to drive it. Let us note Jaffe further down in the same introduction[3]:

'Since the days of these pioneers of American science, more particularly within the last fifty years, there have been two significant changes. These are an acceleration in the tempo of scientific discoveries and a noticeable greater emphasis on theoretical science. One of the reasons for these changes is the final disappearance of the territorial frontier. Restless, adventurous, imaginative men have been *compelled to find new outlets for their energies in the new and never-closed frontiers of knowledge. Men with keen mathematical minds, for example, are no longer snatched up in large numbers by the pioneering business enterprises for their numerous surveys. Instead, they are exercising their mathematical and theoretical powers in research laboratories*' (emphasis added).

We, unfortunately, are still waiting for such adventurous minds amongst us while coolly watching their drift into MBA culture to start careers by counting currency notes or marketing foreign goods and technologies, many of which are covered by patents of other nationals.

However, it is strange that the great nation, the United States, which until recent past succeeded in subduing the urge to commercialize knowledge, seems to have lost sight of the high ideals[4] that guided her policies and efforts in scientific activities to become the world leader in basic science without conceding the position of supremacy in technology. It may be worthwhile for the world scientific community to note that when Benjamin Franklin – often claimed to be the father of American science – was offered a patent by the Governor of Pennsylvania on his innovative stove designed for safe heating of rooms during the cold weather, he refused to oblige, giving the following reason[5]: 'That we enjoy great advantages from the inventions of the others, we should be glad of an opportunity to serve others by any invention of ours'.

And again when confronted by King George III of England (America was still a colony of the British Empire) who had the pointed lightning rods (discovered by Franklin and which became immediately popular because of its effectiveness) removed from the Palace and replaced with the round, knobbed type because of a controversy raised by some scientists close to the King, Franklin quietly withdrew from it, and wrote[6]:

'I leave them to take their chance in the world. If they are right, truth and experience will support them; if wrong, they ought to be refuted and rejected. Disputes are apt to sour one's temper and disturb one's quiet. *I have no private interest in the reception of my inventions by the world, having never made, nor proposed to make, the least profit by any of them*' (emphasis added).

If ever in future we do succeed in generating[1] '. . . more useful "intellectual property" so that the task of protecting it becomes worthwhile', perhaps, we should seek guidance from the spirit of sages like Benjamin Franklin, not that of his modern descendents. But will our recalcitrant stubborn culture with its unnerving indifference towards the quality of R&D and higher education permit the luxury of such dreams, and not reduce us to a race of timid people ready to sell their talents to others for pecuniary benefits?

1. Balaram, P., *Curr. Sci.*, 2000, **78**, 1277–1278.
2. Jaffe, B., *Men of Science in America: The Role of Science in the Growth of our Country*, Simon and Schuster, New York, 1944, p. xxviii.
3. *ibid*, p. xxxiv.
4. John Naughton notes a few brilliant recent exceptions in the history of internet in his book *A Brief History of the Future: The Origins of the Internet*, Universities Press (India) Ltd, Hyderabad, 2000, p. 230.
5. Ref. 2, p. 26.
6. *ibid*, p. 32.

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# Gem cutting – No child's play

I am writing this in relation to the book review by K. Govinda Rajan (*Curr. Sci.* 2000, **79**, 381–382) on *Gems and Gem Industry in India* by R. V. Karanth, published by the Geological Society of India, Bangalore. I am grateful to the reviewer for his appreciation and suggestions to improve the content of the book. I would, however, like to clarify one of the remarks made by the reviewer, (p. 381) – 'photos 8.13 and 8.17 seem to clearly show child labour being employed!'.

The children in the photographs (figures 8.13 and 8.17) happen to be there just to get photographed. Indeed, the fascination for being photographed is a human tendency. As one can visualize the children are just posing in these two

photographs and in figure 8.17, the shy-natured girls are posing as though they are doing some work and the only person (a woman but not a child) actually working in that photograph is facing away from the camera. The gem industry in India has taken proper care to avoid child labour. Moreover, the type of labour in this industry needs a considerable expertise that *only an experienced adult can provide*. The photographs have been published unintentionally and should not be misinterpreted as projecting 'child labour in India'. The Gem and Jewellery Export Promotion Council and Ministry of Commerce in India have taken stern action against child labour involved in this industry. At least as far as my knowledge goes child labour does not exist in the gem cutting industry in India.

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# *Srote features*

A few years back we had received your permission to reproduce articles from *Current Science* in our feature service. We are happy to inform you that we have, since then, reproduced a number of general articles from *Current Science* and these have been well received in Hindi newspapers.

Through this letter, we would like to request the authors of your esteemed journal to contribute to *Srote* (स्रोत) *features* service. *Srote features* is a project sponsored by the National Council of Science & Technology Communication and actualized by 'Eklavya', a voluntary organization working in the field of education. *Srote features* is focused on S&T issues, especially the issues at STS interface. It is dispatched every week to around 150 Hindi newspapers. *Srote* has been published over the last 12 years and its acceptance amongst newspapers is established.

We try to feed authentic S&T information to newspapers, especially small and medium ones. However, not many authors write. We would like the authors to contribute articles (around 1500 to 2000 words) on topics of their choice and of general interest. Even if they write in English, *Srote* will get them translated.

SHASHI SABLOK

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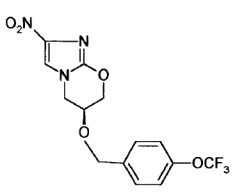
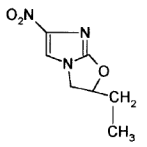
# Nitrobicyclicimidazoles with potent antitubercular activity

I wish to offer some remarks on the article entitled 'A new broad-spectrum antitubercular drug on the horizon' by Pawan Sharma[1]. The properties of PA-824 (**1**) and the thoroughness of the investigation do deserve to be highlighted, although I wonder whether the use of the term 'broad spectrum' is justified, since the activity of **1** according to the authors is highly specific for the *Mycobacterium tuberculosis* (*MTB*) complex and is moderate or negligible against Mycobacteria outside the *MTB* complex (*M. avium*, *M. smegmatis* and *M. fortuitum*)[2].

I like to use this forum more to introduce the anti TB activity of nitroimidazooxazole, CGI 17341 (**2**) (ref. 7 in the article) which we had synthesized at Ciba-Geigy Research Centre in 1984 and which we first published in 1989 (ref. 3). **2** was about equiactive with isoniazid and rifampicin H 37 Rv *in vitro*. In an *in vivo* mouse model with *M. bovis* infection, **2** was more than half as active as rifampicin. In a subsequent publication[4] which Sharma's article does not refer to, we had shown that **2** was highly active *in vitro* against strains of *MTB* resistant to isoniazid, rifampicin, ethambutol and streptomycin. It was moderately active against *M. kansai*, *M. scrofulaceum* and *M. gordonae* but inactive against *M. avium*, *M. fortuitum* and *M. intracellurare*. Interestingly the *MIC* of **2** against *MTB* strain 437Rv was independent of the pH of the medium in the range of 5.6 to 6.8 like rifampicin, whereas those of isoniazid and ciprofloxacin were increased 4 to 6 times at the lower pH in this range. In an *in vivo* model of *MTB* infection in mice, **2** was highly active with a potency of about 50% of isoniazid and rifampicin. Stover *et al.*[2] have acknowledged our two publications in their paper in *Nature* as well as in their patents.




**1** PA-824




**2** CGI 17341

**2** was mutagenic in the standard Ame's test while **1** is reported by Stover