

habitats and allowed to multiply.

The concluding session of the seminar was devoted to panel discussion in which P. Kachroo, D. S. Loyal, S. S. Bir, S. C. Verma, T. N. Bhardwaja, and S. Bhambie participated. A detailed 10-point recommendations were made with regard to teaching and researches in Pteridology in India. Finally, it was recommended to the Department of Environment, Government of India that there is dire need for the (i) establishment of Fern conservatories within tropical, subtropical and temperate forests in different regions of India, and (ii) introduction and maintenance of endangered and rare species in botanic gardens.

The symposium was financed by the Department of Environment, Government of India, New Delhi; Indian National Science Academy, New Delhi and Punjabi University, Patiala and held under the auspices of the Indian Fern Society. The deliberations of symposium have helped in highlighting the present status of pteridological researches in India and in establishing contacts amongst the scientists engaged in work on ferns and fern allies. The proceedings of the symposium are being published in the Indian Fern Journal.

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NEWS

NIELS BOHR: MODEL OF SCIENTIFIC INTEGRITY

...“I see four principles of integrity of science that possessed (Niels Bohr) to the end, four principles that can be emulated in our time. The first of these is simply this: Try to get it right at all costs, sparing no effort. You may have to seek help and advice where possible; but then proceed with the courage of your conviction to prove to others that your scientific idea is correct.... As those of us who has the fortune to meet and talk with Niels Bohr know very well, he was always in the middle of a struggle to understand, and to communicate his understanding. I once asked him why he expressed himself in such a complex way when he spoke, complex even compared to his writings, and he answered, ‘I do not choose to speak more clearly than I think’.... The second principle might run as follows: Try to be a scientist first, a specialist second. If you have it in you to make more than individual bricks that others might use, throw your life’s energies into work on what Einstein called the great temple of science. Again, Niels Bohr can give us all the examples we need, even in

his 1913 paper, where he introduced the correspondence principle in its early form precisely in order to connect quantum physics with classical physics in the limit of large orbits. It is a powerful bridge which Bohr used to great advantage for years, for example for the theory of stopping fast-moving particles in matter, in his 1948 survey.... The third principle of integrity in science might go like this: ‘Science is, and must be, part of the total worldview of our time. This is a vision you should imaginatively explore, defend, and contribute to.’ (And fourth is) the last and most demanding of the principles of integrity: the special obligation scientists have to exercise sound citizenship, each in his own way.”

[(Gerald Holton (Harvard Univ.) in *American Scientist* 74(3): 237–43, May-June 1986, (Sigma xi, The Scientific Research Society), Reproduced with permission from Press Digest, *Current Contents*[®], No. 28, July 14, 1986, p. 12. (Published by the Institute for Scientific Information[®], Philadelphia, PA, USA)].

DOCTORS DELIVER BLOWS TO BOXING

...“Many people question why boxing (along with full-contact karate) has been singled out from all other sports for such major opposition by physicians. The data are clear: blows to the head in boxing damage the brain. While a few severe blows may kill acutely by cerebral contusion and edema and subdural hematoma, chronic brain damage results from repetitive subconcussive blows over multiple training sessions and matches. It is the high frequency of chronic brain damage (60% to 87%) among boxers who have had many fights that sets boxing apart medically. In comparing risk sports in regard to odds of death per unit of time of participation, mountain climbing, parachuting, and hang gliding are considered ‘high risk’ while professional boxing and scuba diving are ‘medium risk’. Figures from 1983 for US injuries by sport showed boxing leading the list at 50% of participants experiencing injury, followed by American football

at 30%, baseball 3%, basketball 2%, and the others trailing.... If the highly vocal proponents of amateur boxing truly do not wish their fighters to win or lose by virtue of brain damage, they should be able to devise rules to prevent this. Society no longer sanctions sword duels in which one participant runs the other through; we now see skillful swordsmanship in the ritualized form of fencing. Amateur boxing could also be ritualized into safety if the responsible leaders so choose.”

[(US Congress, Office of Technology Assessment in *The Regulatory Environment for Science—A Technical Memorandum*, Washington, DC: US Government Printing Office, Feb. 86), Reproduced with permission from Press Digest, *Current Contents*[®], No. 26, June 30, 1986. p. 10. (Published by the Institute for Scientific Information[®], Philadelphia, PA, USA)].

THE FASTEST CHEMICAL REACTION ON EARTH

...“Two physicists have timed what appears to be the fastest recorded chemical reaction. Tien Tzou Tsong and Yung Liou of Pennsylvania State U. measured the time it takes the rhodium helide (RhHe^{2+}) ion to dissociate into its constituent elements, rhodium and helium, when it is subjected to an electric field. They found the reaction takes place in about eight ten-trillionths (10^{-13}) of a second. That kind of interval cannot be resolved by current electronic timers. As Tsong and Liou report in *Physical Review Letters*, they had to measure the dissociation time indirectly by modifying the device in which the rhodium helide ion was first detected: a field-ion microscope. Such a microscope images individual surface atoms at the tip of an extremely

fine needle. The needle is put in a chamber filled with helium gas and is positively charged to between 5,000 and 10,000 volts. The resulting electric field at the tip of the needle is high enough to ionize helium atoms near the atoms of the tip’s surface. The ions are then accelerated radially from the tip toward a fluorescent screen, where they impinge to form a visible pattern of light spots. Each spot corresponds directly to an atom at the tip’s surface.”

[(In *Scientific American*, 254(5): 169-70, May 1986). Reproduced with permission from Press Digest, *Current Contents*[®], No. 26, June 30, 1986. p. 11. (Published by the Institute for Scientific Information[®], Philadelphia, PA, USA)].