

AIDS TARGETED INFORMATION/ATIN

TARGETS YOUR LITERATURE SEARCH

Expand your base of knowledge about AIDS/HIV with *AIDS Targeted Information/ATIN*. Every month, *ATIN* not only provides abstracts but also in-depth evaluations of the current published scientific literature on AIDS. Written by clinicians and researchers for clinicians and researchers, *ATIN* provides an authoritative command of the world's literature on AIDS. Published by Williams & Wilkins. Indexed. 12 issues per year. \$125.

To order call
1-800-638-6423

Sponsored by the American Foundation for AIDS Research (AmFAR).

Reader Service No. 430

New paperbacks

- Recently reissued as a paperback by Freeman is Steven Weinberg's *The Discovery of Subatomic Particles*, originally published in 1983 as part of the Scientific American Library series. Price is £11.95.
- *Ancient Forests of the Pacific Northwest* is edited by Elliot A. Norse under the auspices of the Wilderness Society. The essays in the book cover the "grandeur, complexity, diversity and impending destruction of a fragile and vital ecosystem". Publisher is Island Press, price is \$19.95.
- Two new volumes in the Laser Science and Technology International Handbook series are *Photobiology of Low-Power Laser Therapy* by T. I. Karu, price \$54, and *Refractive Non-linearity of Wide-Band Semiconductors and Applications* by A. A. Borhch, M. Brodin and V. Volkov, price \$42. The first few volumes in the series were reviewed by Peter Knight in *Nature* **344**, 501; 1990. Publisher is Harwood.
- The latest volume from the Panos Institute is *Miracle or Menace? Biotechnology and the Third World* by Robert Waigate, who used to be *Nature's* European correspondent. The volume explains the science behind, and examines the implications of, new developments in biotechnology. Price is £6.95.
- New from the University of Chicago Press is *Frozen Fauna of the Mammoth Steppe* by R. Dale Guthrie. The book is about the mummified mammals frozen since the ice age, in particular the 36,000-year-old bison called "Blue Babe". Price is £13.50, \$19.50. (Also available in hardback at £31.95, \$45.95.) □

Trucking on

Paul Calvert

The American Synthetic Rubber Research Program. By Peter J. T. Morris. University of Pennsylvania Press: 1989. Pp. 191. \$34.95, £33.20.

AT THE outset of the Second World War tyres were mainly made of natural rubber from Indonesia and Malaysia. To avoid a loss of supplies, both Germany and the United States put a huge effort into building a synthetic rubber industry. The best available rubber was a styrene-butadiene copolymer prepared by emulsion polymerization. This was first developed in

search progress into incremental improvements, large improvements and breakthroughs. Incremental improvements in processes came continuously and were shared between the companies, but probably would have come anyway. Large improvements could mean a significant competitive advantage to a company so each one tried to keep these outside the programme and the pool of shared information. Breakthroughs can be very expensive and can upset a smoothly running bureaucracy and thus are to be avoided if possible. There really were none of these in the course of the programme.

The bulk of the \$7 million university funding went to Illinois, Chicago, Minnesota and Cornell. Marvel's group at

IMAGE UNAVAILABLE FOR COPYRIGHT REASONS

Searching for new polymers — no alternative in the haystack

Germany in 1929 and was adequate for car tyres but not good enough for truck tyres. There was no way to synthesize "natural rubber", *cis*-polyisoprene. From 1942 to 1956 the US Government spent \$56 million on a well-organized research effort to ensure a domestic supply of rubber for car and truck tyres. The goals were then to set up efficient production plants, to improve the properties of the rubber produced and preferably to replace it with a better synthetic rubber.

Morris has interviewed many of the participants in the scheme and asks whether the research and development programme was a success. His answer is a qualified "no". The overall production programme was a success in that \$700 million was invested in 51 plants to produce 720,000 tons of rubber a year by 1945, but the research produced no major new rubber and when synthetic *cis*-polyisoprene finally came it was too expensive. The main participating companies were Goodyear, Goodrich, US Rubber and Firestone with Phillips Petroleum and General Tire on the sidelines.

It is fascinating to follow Morris in his conclusions. One reads a section thinking "Well, this aspect was not a success, but he has forgotten such-and-such a spin-off" and then sees that argument demolished in the next chapter. Morris divides re-

Illinois put a large effort into developing more than 100 new rubbers but none of them were better than butadiene-styrene. It is a characteristic of materials research that the first round of work often produces a material which is never bettered in subsequent projects. Flory at Cornell did a great deal of good polymer science but seems to have been regarded as extraneous to the main programme. The late 1940s and 1950s were a time of very rapid growth in polymer science and in the plastics industry. Morris argues that the academic contribution to progress by the rubber industry was small. There was mistrust of the universities by the companies. On the academic side, there was little knowledge of industrial problems and a lack of appreciation of short industrial timescales.

Many of the participants in the programme think of it as a great success. It is a bit unfair to criticize them for not finding an alternative rubber for truck tyres, for it is clear that there really wasn't one. The haystack had no needle in it.

Morris is not a polymer scientist, but there are few places where this really shows. An appendix summarizes polymer chemistry for the uninitiated. □

Paul Calvert is in the Department of Materials Science and Engineering, University of Arizona, Tucson, Arizona 85712, USA.

Hulton-Deutsch Collection