along with misleading picture captions — lead one to false conclusions about who made a particular decipherment.

There is no mention of ceramics, even though the bulk of Maya texts are on pottery; this, in spite of much recent research that has cast light on the position of Maya scribes, on shamanism and beliefs about the underworld, and on the relation of scenes and texts to the mythic world of the *Popol Vuh*, the great epic of the Quiché Mayans.

The book is therefore hopelessly out of date, a conclusion strengthened by the inept drawings of Maya glyphs, which revert to a style prevalent before the publication of Catherwood's renderings in 1841. A colleague has described this as a 'Rip Van Winkle book'. Yet even Rip, waking from his 20-year slumber, finally realized that a revolution had taken place. Sadly, King George III is alive and well in these pages. □

Michael D. Coe is at the Peabody Museum, Yale University, New Haven, Connecticut 06511-8161, USA.

■ Newly published in paperback is *The Mesoamerican Ballgame* edited by V. L. Scarborough and D. R. Wilcox. Played with a solid rubber ball on masonry courts, this sport extended all over pre-Hispanic Mexico and Central America. The book claims to provide "complete coverage of the archaeological, sociopolitical, iconographic and ideological aspects of the game". University of Arizona Press, $18.95.

Science on trial

Lee Loevinger

Regulating Toxic Substances: A Philosophy of Science and the Law. By Carl F. Cranor. *Oxford University Press: 1993. Pp. 252. $45, £35.*

THOSE of us who have laboured long in the area where law and science intersect have generally agreed that an important concern is to make law more responsive to science. Now comes Carl Cranor, a philosopher who is neither a scientist nor a lawyer, to tell us that law is too responsible to science. His thesis is that "we should avoid the temptation to adopt the ideals of research science in torts and administrative law because this tends to lead to an excess of false negatives and to underregulation of carcinogens as well as to the undercompensation of plaintiffs in tort cases".

The book's title is broader than the text, as the book concerns only carcinogens, rather than toxic substances generally, and its science is restricted to epidemiology. Aetiology is mentioned only to state that the aetiology of carcinogenesis is not understood. All potential defects of animal bioassays and sampling errors are explored at length; and extensive statistical analysis purports to show that risk assessment is unreliable. Cranor explains that standard statistical analysis requires acceptable data to have a probability of a type I error, or false positive, no greater than 0.05, which means that researchers can have 95 per cent confidence in their results. He correctly observes that this is a common confidence level in science.

Cranor argues that the 95 per cent rule is appropriate in scientific research, but not in law because we must tolerate false positives (false diagnoses of cancer) resulting from a lower standard of proof to reduce false negatives, thus providing maximum legal protection (against cancer). The practical justification for this position is the economic assumption that regulatory false negatives are ten times as costly as regulatory false positives. The philosophical argument is that any standard of proof implies normative judgement, and it is better to overregulate than to underregulate cancer hazards.

One adventitious circumstance may make much of the discussion of tort cases irrelevant. This book apparently went to press in December 1991. But in October 1992 the US Supreme Court took jurisdiction of a case (*Daubert* v. *Merrell Dow* 92–102) in which the issue is what criteria courts should use in determining the admissibility of scientific evidence. The case should be decided by the end of June. While no one can predict the decision, it will probably establish definitive rules for consideration of scientific evidence in tort cases.

Whatever the decision, it will surely be based on appraisal of competing normative or policy considerations. Categories of proof in different types of cases are based on judicial judgements of relative risks and values. Although not expressed with statistical precision, these distil much practical experience which may be as valuable as philosophical rumination.

Most of this book is polemical rather than philosophical. In the last chapter, Cranor rejects utilitarianism and advocates an approach based on an artificial and unrealistic hypothesis that is unimaginable except to the mind of a philosopher. Neither Jeremy Bentham's utilitarianism nor Rawls's theory of justice is influential in modern law. Cranor is flogging a dead horse.

Cranor seems to lack a feel for the flexibility of Anglo-American common law and to misunderstand the significance of the categorical standards of legal proof. For example, he quotes the aphorism that in criminal law it is regarded as better that ten guilty men go free than that one innocent man be wrongly convicted. This, he says, implies that in criminal law, false negatives should be in the ratio of 10:1 to false positives. This is absurd. Every rational judge would be outraged at the suggestion that ten per cent of convictions are false positives, or convictions of innocent people. Although there are rare cases in which innocent people are convicted, the percentage is tiny.

In short, despite professions to the contrary, Cranor is anti-science, as exemplified by his statement that the effort to make risk assessment more scientific is "wrongheaded" (page 129). He correctly asserts that science is no substitute for morals. But neither is philosophy a substitute for science.

Plaintiffs' lawyers in cancer cases will find this work most helpful in discrediting scientific evidence used against their claims. Others will find it less interesting. □

Lee Loevinger is at Hogan & Hartson, 555 Thirteenth Street NW, Washington DC 20004-1109, USA.

ECO-DRIVE — tourists in the United States were familiar with Yosemite Valley more than a decade before the Grand Canyon and Yellowstone were even explored. This 1920 advertisement for Horseshoe Route appears in *Yosemite: The Embattled Wilderness* by Alfred Runte, which addresses the conflict between preservation and use of America's national parks. University of Nebraska Press, $14.95, £12.95 (pbk).