Our knowledge is so weak as to how the outputs of the three types of cone are organized to produce colour vision that the study "by special methods" of how the mechanism is modified in disease promises to throw new and much-needed light. This promise remains utterly unfulfilled. No special methods are devised, and no light falls.

Yves-le-Grand (as usual) is incisive, lucid, balanced and up-to-date in his account of where we stand in the knowledge of photopigments. But no contributor builds upon this solid foundation, or even asks specifically the simple question "Is this change in colour vision due to a change in the spectral sensitivity of a cone pigment?" Still less are the simple experiments explicitly performed that will answer this.

Thus anyone who had hoped that this book would throw new light on the organization of colour vision will be disappointed, for it is not written for him but for practising clinicians. But if a reader has the time and the analytical invention himself to engage in the "still very mysterious" domain of acquired dyschromatopsias, and will wrest from that confusion some insight into the organization of colour vision, this book describes a great variety of conditions, and may well suggest to the perceptive some promising points of attack.

W. A. H. RUSHTON

Sociology of Science

The Social Contexts of Research. Edited by Saad Z. Nagi and Ronald G. Corwin. Pp. xii+409. (John Wiley: New York and London, August 1972.) £5.65.

THIS is a very successful collection of essays; the editors have been able to achieve a coherence and thoroughness that are not at all common in such multiauthored works. For the area of studies and policies that might be called "the social administration of research", this book can function as a reliable compendium of the best recent thinking.

The editors themselves contribute an introductory "overview" of the topic, usefully summarizing much recent philosophy and sociology of science; and in the last esssay they apply the materials of the book to their own field, educational research. The other nine essays include contributions by such well-known authors as Howard N. Vollmer, Don E. Kash, Simon Marcson and Norman W. Storer; together the essays cover every aspect of the description of research as a socially organized, highly differentiated activity, conducted within a variety of institutional contexts. It is noticeable that the general discussions of research are based on the experience of the natural sciences and their technologies, while particular problems, as those discussed by the editors and by Irwin Deutscher (on false answers to survey questions), come from the human sciences. This slight imbalance probably reflects the difficulty (that may be lessening now) in finding authors to produce a scholarly résumé of work on particular social and moral problems of "hard" science.

To a reader concerned to understand and cope with the multiplicity of difficulties now facing "the research enterprise", the impression finally conveyed by these very competent surveys is one of blandness. For example, there is the problem of the supposed propensity of scientists to prefer to work on "pure" research unless bludgeoned into more socially responsive ways; why should this be so (if it is so)? Vollmer provides an admirable study of the literature, whose conclusion is more or less that the purist preference is one of those habits that students get at university and hold until circumstances force them to change. One knows that there must be more to it than that; but it might well turn out that only the "entrepreneur" interpretation of the independent research scientist can explain the phenomenon fully. On another key problem, inter-disciplinary conflict, N. W. Storer offers a reasonable general survey, but in a footnote engagingly confesses his naïveté about the ferocity of such struggles; while the editors' essay gives a thorough taxonomy of the phenomenon along with good insights about its causes.

The one jarring note in the book comes from the political right, with a tendentious and inexpert essay "Forbidden Knowledge" by W. Petersen, a vigorous and refreshing denunciation of the left-wing radical critics of science in America. One might say that such discussions belong to a different book; but it could be answered that a book that ignores the politics of the research industry has not really covered its "social context". It is only from the texts that Petersen quotes disapprovingly that one is reminded that there are a variety of problems associated with a military involvement of university research; that the market and institutional forces shaping research and development do not work so well as to preclude serious discussion of misdirected technology; and that there is still some idealism, doubtless confused and perhaps misguided as well, about something called Science that is distinct from Research.

But these criticisms on the deeper problems of science policy should not detract from the real value of the book for the limited range of problems to which it is devoted.

J. R. RAVETZ

Photochemistry of Smog

Chemical Reactions in Urban Atmospheres. Edited by Charles S. Tuesday. (Proceedings of the Symposium held at General Motors Research Laboratories, Warren, Michigan, 1969.) Pp. xiv +287. (American Elsevier: New York, Amsterdam and Barking, December 1971.) Dfl. 60; $17.75.

THIS volume is likely to be of interest to anyone who wishes to understand the thermal and photochemical reactions which are responsible for the production in the atmosphere of contaminants which constitute "photochemical smog", for it contains eleven papers concerned with various aspects of this problem each followed by brief symposium discussion contributions. Many of the papers give mechanisms with rate constants or relative efficiencies of reactivity for elementary reactions which are suggested as being of possible importance in producing atmospheric pollution. The experimental conditions used include simulated atmospheres as well as conventional gas phase, photochemical and thermal reactors. Although much of the discussion is speculative the kind of experimental evidence available to test the various theories is well illustrated in this volume.

The more applied articles are a discussion of the role of singlet molecular oxygen in the chemistry of urban atmospheres with particular reference to the Los Angeles Basin, a paper entitled hydrocarbon reactivities and nitric oxide conversion in real atmospheres and an analysis of photochemical reactions involving gaseous contaminants of urban atmospheres that result in the formation of aerosols as studied in a large irradiation chamber. In this last paper the problems associated with studies using simulated atmospheres are discussed. Chapters dealing with thermal and photochemical reactions of atmospheric pollutants include those concerned with reactions of sulphur dioxide and the methyl radical-sulphur dioxide reaction. The reactions of oxides of nitrogen receive considerable attention with further articles on the reaction of nitrogen dioxide with olefins and aldehyde-olefin interaction in nitric oxide photosensitized oxidation of aliphatic olefins. The remaining articles are kinetic studies of the photolysis and photo-oxidation of alkyl nitrites, formaldehyde and carbon disulphide in the gas phase together with a report of a very interesting study, using fast flow and static methods, of the reaction of $O(^3P)$ with acetaldehyde, propionaldehyde and acrolein, all of which are known pollutants present in photochemical smog.

All the papers are of high standard and are well presented. The factual information given concerning the