assessment of this tool of quality assessment took on real practical urgency.

Blaise Cronin narrates the interaction between the development of the new sociology of science and the increasing sophistication in the criticism of citations. His basic insight is that citation is an intensely personal process (a "subtle craft skill" for which there is scarcely any formal training) which has a product that is public, and moreover of great importance in the government of science. He reviews the leading positions on the sociological side (those of myself, I.I. Mitroff and the "social construction" or "lab-life" school), and brings us up to date on the attempts to bring some order into the citation process. But it is still an open question whether any scheme that is sufficiently simple to be effective as a guide to practice can encompass both the complexities of the cognitive aspects of that process and the subtleties of the motivational side. And in the last resort, the communities of working scientists still show remarkably little interest in the whole problem.

Cronin's analysis suffers, in my opinion, from its failure to take note of the policy issues which have shaped the study of citations during its brief history. The reliance on citations was part of the "science of science" movement led by Bernal's disciple D.J. Price, and now carried on as "scientometrics". The challenge of the *Science Citation Index* led to the critical and ultimately self-critical discussions of the "science indicators" movement. It is significant that more recent consideration of the assessment of quality in science has moved from the original quantitative techniques to deeper problems of the ultimately political processes of the setting of dominant criteria of quality.

Within its limitations, this study does offer a condensed synoptic survey, and also many useful bits of information. For example, the *Science Citation Index* works from a mere 2,000 journals, thus providing a practical solution to the problem of the "information explosion" which seemed so urgent in the 1960s. By the fiat of its advisors, the overwhelming majority of journals and of published papers are deemed as failures, not worth noting in this standard quality-index.

To conclude with one small personal grievance: Cronin says nothing about the form of citations, and seems to consider that as unproblematic. Thus he himself automatically cites materials from a particular edition at hand, even though this may radically distort the historical process. R.K. Merton's fundamental work is dated to 1973 (some 30 years late) though the author confusingly refers to a "subsequent" publication of 1957. But this small defect in citation technique should not prevent the book's being cited, or even being read. □

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Parasites in the lab

F. E. G. Cox

Genes and Antigens of Parasites: A Laboratory Manual, 2nd Edn.

Edited by C.M. Morel.

Dept Biochemistry and Molecular Biology, Instituto Oswaldo Cruz, Rio de Janeiro: 1984. Pp.586. Available from A.O. Lucas, SPRTTD, WHO, 1211 Geneva 27, Switzerland. No charge.

THE intrusion of molecular biology into parasitology has necessitated the production of a laboratory manual, to serve both as a book of recipes for laboratory investigations and as a source of information for parasitologists bewildered by terms such as genomic libraries, Western blotting and zymodemes. Here it is.

This cook-book is based on the laboratory manual used during a five-week course on genes and antigens of parasites, held at the Oswaldo Cruz Institute in Brazil at the end of 1983. The published version, revised and enlarged, is spirally bound, in traditional cook-book fashion, and contains 34 chapters organized into five sections — general techniques, character-

ization of parasites, recombinant DNA, surface antigens and hybridoma technology. The chapters are by scientists experienced in their fields and each is set out with step-wise instructions and elaborate technical details. The book is designed to be informative and in that it succeeds, although suffering a little from the lack of a proper index.

The emphasis is largely on Chagas' disease and leishmaniasis; however the general principles apply to parasites that cause other diseases and the 628 references will guide the investigator into the literature of the subject as a whole. No cook-book can be completely satisfactory, and the techniques may have to be modified, but there is plenty of space for the pencilled amendments that quickly characterize a book of this kind. *Genes and Antigens of Parasites* will be invaluable not only to research workers but also to teachers planning up-to-date practicals in parasitology. Every active parasitologist should have a copy, and should also respond to the editor's request for comments which will ensure the publication of a third and even better edition. □

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A plague behind us

Keith Dumbell

Princes and Peasants: Smallpox in History.

By Donald R. Hopkins.

University of Chicago Press: 1984. Pp.380. \$28.75, £21.25.

THE eradication of smallpox has been an undersung triumph. Europe and North America have, for a generation, known smallpox only as an occasional visitant, following the arrival of infected persons from endemic areas. Despite some inevitable panic, each incident has been effectively contained and eliminated.

How different was the situation a couple of generations earlier when smallpox was a fact of life. And how different it was in those countries where the disease remained endemic and where, even in 1967, smallpox killed about two million of the 10–15 million people now believed to have been infected in that year.

As part of the epitaph of smallpox, it was necessary for someone to remind us of the magnitude of the scourge that has gone. Donald Hopkins set out to tell the story of smallpox, but what particularly fascinates him is the role that the disease has played — whimsical, unpredictable and often devastating — in the daily life of mankind and the course of history.

Some of the episodes are fairly well known, but nowhere else that I know is

there to be found such a compact account of smallpox in all five continents and of its impact on the history of each. Smallpox neutralized armies and removed princes at politically critical times. It played a continual part in determining the events that political and social history record. Hopkins follows this theme with vigour and includes, for good measure, some near misses such as the delivery of the Gettysburg address the very evening before President Lincoln himself became a temporary victim of smallpox. By necessity the author casts only a glance down some intriguing avenues, but the extensive reference list will help readers who wish to explore them in greater detail.

While Hopkins shows us the potency of smallpox virus as mankind's enemy, he does not stress how relatively puny was the David that overthrew this Goliath. *Princes and Peasants* is a prologue to the story of eradication, a tribute to the disease that has been beaten. There is no forecast of other plagues to conquer, no comment on other achievements within the reach of a similar international co-operation. Indeed this is not a reflective book; it is a simple narration of events, written with obvious enthusiasm. I found it a sobering and broadening experience to be exposed to Hopkins's story — there will be few people who would not benefit from reading it. □

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