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Writing Technical Reports

Bruce M. Cooper



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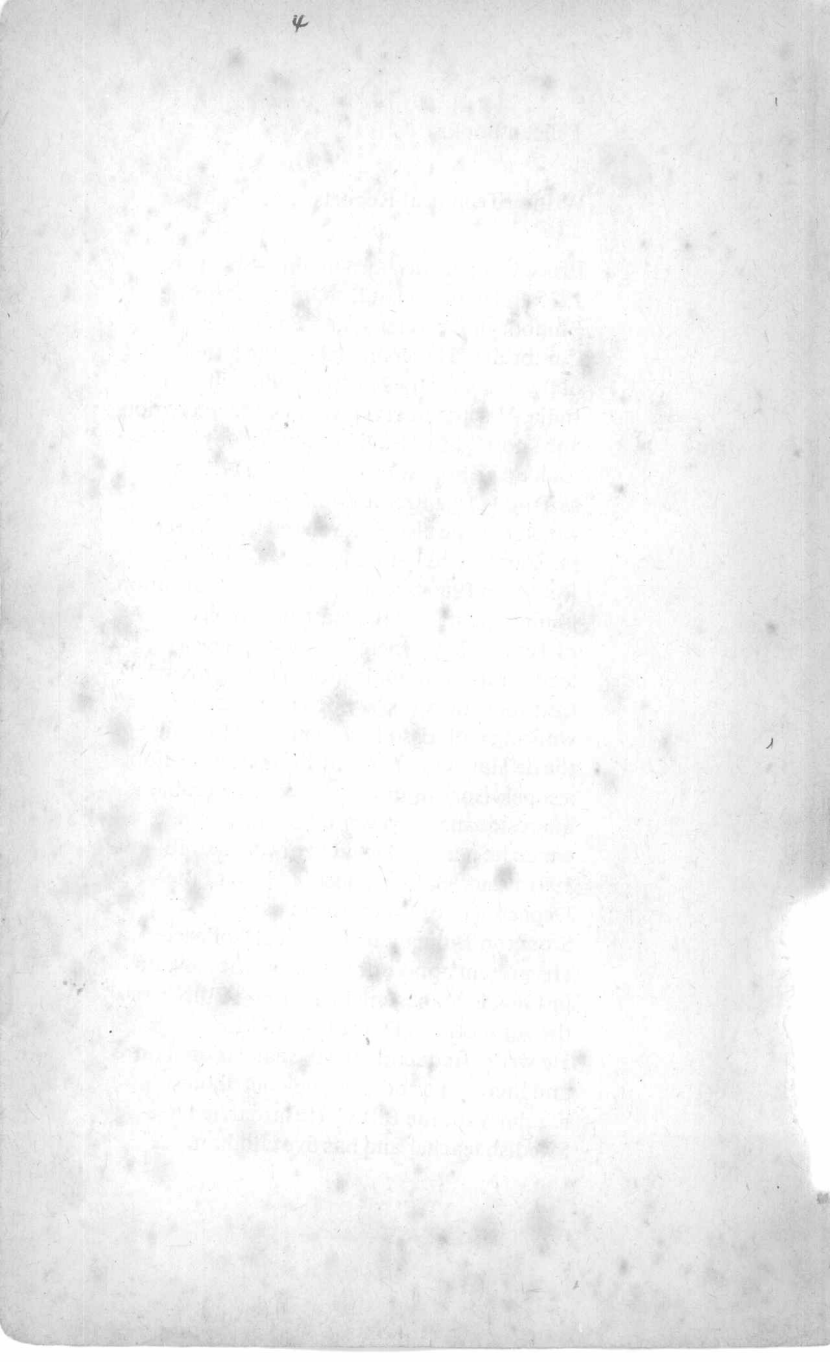
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Pelican Books

Writing Technical Reports

Bruce Cooper was born in Shrewsbury in 1925 and educated at Ratcliffe College, Edinburgh University, and Peterhouse, Cambridge. He served during the latter half of the war with the Royal Artillery in India. His first interest was in adult education, and shortly after leaving Cambridge he took up an appointment with the W.E.A. as Tutor-Organizer for Suffolk, during which time he also lectured to H.M. Forces for Cambridge University Extra-Mural Board. In 1956 he entered technical education, joining the staff of the Hatfield College of Technology, where he later became a lecturer in Communication. During his time there he was seconded to industry, working with Esso Petroleum and helping the de Havilland Aircraft Company develop a supervisory training scheme. He became interested in report writing, a subject in which he has conducted many classes. In 1961 he accepted the post of Head of the Department of Liberal Studies at Stockton/Billingham Technical College. His present appointment, which he took up in 1966, is Management Training Officer for the Agricultural Division of I.C.I. He writes frequently for the educational press and literary periodicals and contributes regularly for the B.B.C. He is married to a Swedish teacher and has five children.



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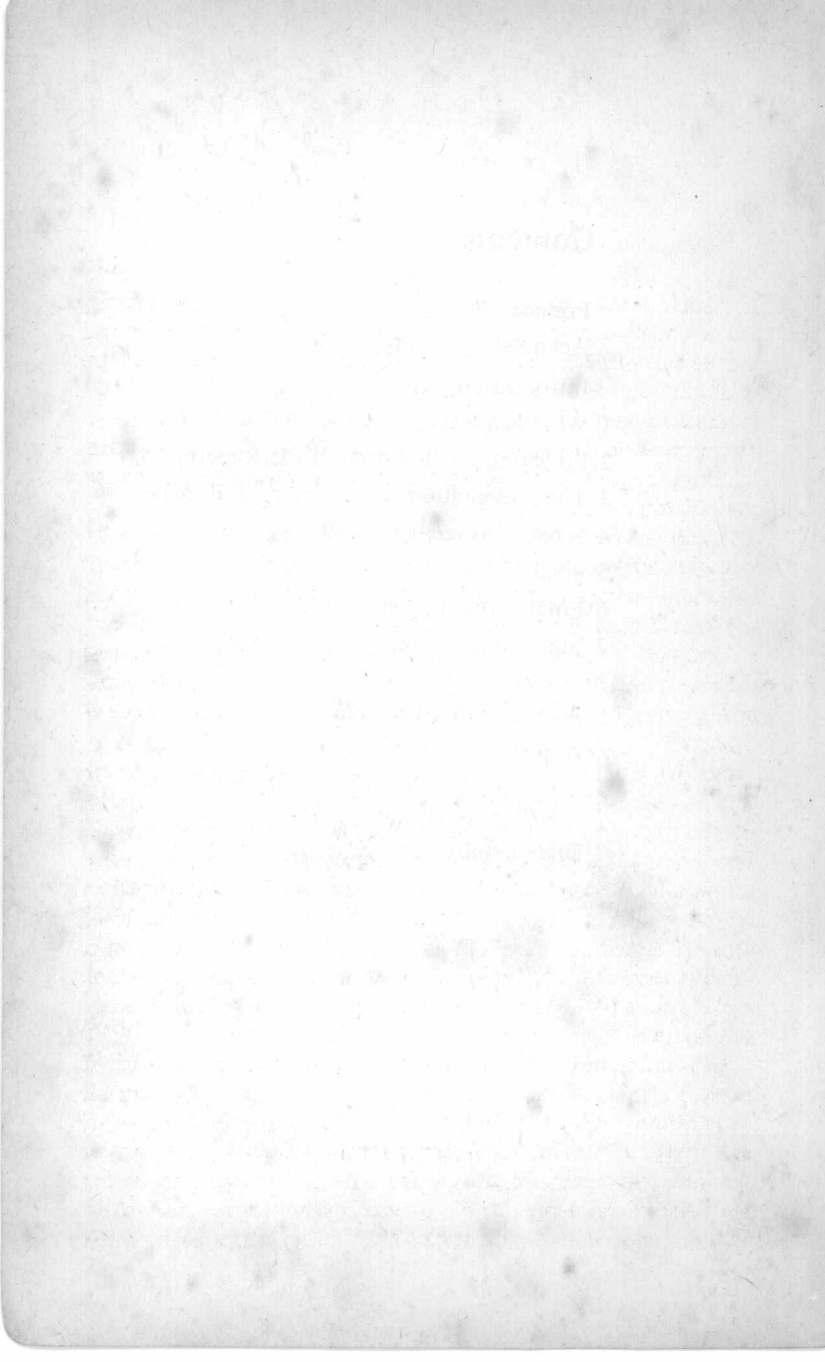
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Preface

For some years I have conducted report-writing classes, mainly for scientists and engineers. When I was asked to write a book on the subject, I consulted a friend upon what form he thought it should take. His advice was to describe the sort of things I do in these classes. This is what I have tried to do. I assume the reader, as I do the student in the class, to have some knowledge of English, and so there are very few rules of grammar or punctuation to be found.

As most of the difficulties which crop up in reports are to do with writing rather than structuring the material, or wondering whether or not to capitalize a word, my practice is to put up on the blackboard those passages in the reports which I do not understand. Together we discuss the reasons for failure to communicate and attempt to categorize the faults. Hence the numerous examples in this book of selected extracts from typical reports.

Writing a book is different from taking a class, and in doing so I have drawn, in some cases overdrawn, from the experience of other people working in this field. My biggest debt is to B. C. Brookes of University College, London, who has not only allowed me to use much of his own material but has helped to structure my own thoughts upon the subject of technical writing. He and Professor R. O. Kapp, through their work with the Presentation of Technical Information Group, have done more than anyone in this country to popularize the importance of good technical writing.

I should also like to thank J. C. Y. Baker for filling a gap I could not have filled so expertly, in his chapter on 'Technical Illustration'; G. H. Wright for his appendix on 'Sources of Information'; M. W. Ivens, formerly Communication Manager for Esso Petroleum, for the guidance he gave me whilst working with that Company; R. W. Lewis, my colleague at Hatfield College of Technology, for the help he gave me both in the

initial stages of writing this book and in suggesting improvements to the rough draft; Z. M. T. Tarkowski for his very useful distinction between Jargon and Technical Terminology, made in a paper to the P.T.I. Group at University College, London; and lastly the de Havilland Aircraft Co. Ltd for permission to quote so freely from their reports.

During my period with Esso Petroleum I was impressed by the way report writing was treated as a real industrial problem. Many courses on the subject were run by the company aimed at improving communication. Michael Hall conducted these classes with consummate skill. Some of the ideas he put across I have felt worth while including in this book.

Preface to Third Impression

It is encouraging that two reprints should have been called for so soon after initial publication. As the book has been so well received, I have limited myself to making only essential correction and alterations to the text.

I am grateful to friends (and reviewers) who have taken the trouble to point out inconsistencies and to make suggestions for improvement.

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Introduction

The purpose of this book is to examine how technical information may be written and presented so that it is easy to read and understand. It is addressed to the many scientists and engineers whose jobs require them to do more report writing than they would commonly like.

Is there a need for such a book? Do scientists and engineers do all that amount of writing to justify a study of it? Professor Edgeworth Johnstone, Lady Trent Professor of Chemical Engineering at Nottingham University, conducted a survey among practising chemical engineers to find out what they actually did in their jobs. The survey revealed that they spent almost one third of their working time on report writing, economics, and management.

How well do they perform this job of writing? If one is to judge from the amount of quicker reading and report-writing courses being held up and down the country, or from the remarks of senior management, the answer must be 'none too well'.

The reason for this deficiency is complex. In some cases it is the sheer inability to write clearly. The passage below was written by a very able and intelligent graduate engineer. It appeared after the title page of the report and thus was the first indication to the reader of what the report was about. It was entitled, 'Summary'.

The main theme of this Report is a justification for the elimination of pressure testing all copper tubing used for condensers and heat exchangers.

It is apparent that this testing has been carried out for a considerable period because of troubles experienced a number of years ago. Analysis of recent records, however, suggests that modern manufacturing techniques have improved the quality of materials to the point where reliance may be placed on the products of reputable suppliers.

If the main recommendations of this Report are accepted, the way is open for the complete re-organization of the Test Shop, integrating the Annealing Shop into it with resulting improved operator utilization.

Further method improvements following a re-layout of the Test Shop (made possible by released area no longer required for testing) will result in a final savings figure of approximately £20,000 per annum.

This passage is not untypical of that to be found in many reports. It is not all that difficult to understand what the writer is describing, as is the case in some reports. But if the purpose of writing is to reveal its meaning immediately and with the minimum of difficulty, this passage fails. It typifies many of the common faults which are to be found in reports, the avoidance of the first person and the use of the passive voice, 'where reliance may be placed' rather than 'where we may rely'. It shows a preference for the abstract word and for the cliché. The opening sentence would sound, as well as read, better if one said:

The main purpose of this report is to justify the elimination of pressure testing of all the copper tubing which is used for condensers and heat exchangers.

And what does 'improved operator utilization' mean? Does it mean that the existing operatives will be able to do more work, increase their output, do different and additional work, or does it mean that the company will be able to reduce the number of operatives? The expression has become a cliché.

Too many of the words carry too little meaning. What is 'a considerable period of time' and what are 'a number of years ago'? Three years? Six years? And what were the 'troubles experienced'? Fracturing of the tube? Shop-floor difficulties? What do expressions such as 'It is apparent that' and 'to the point' convey other than padding? 'Further method improvement' presumably means further improvements of method, but could mean further methods of improvement. Does a 'final savings figure of approximately £20,000 per annum' mean more than a 'savings of approximately £20,000 per annum'?

Could not the third paragraph have possibly been placed

second? Would it not have read better if a full stop had been placed after the phrase, 'integrating the Annealing Shop into it'?

Is this being pedantic? The plain fact is that you communicate more effectively when you adopt the active voice, when you write in shorter rather than longer sentences.

Communication is a more difficult act than is realized. It is strange that the craft of writing, the training in its skills, should for all intents and purposes end at the age of about sixteen, when most apprenticeships, whether they be in art or music, engineering or building, are just beginning. With the attainment of the General Certificate of Education in English Language at Ordinary Level, correction of writing ceases. Correction which has taken place earlier too often centres on such irrelevant rules as not starting sentences with the conjunctions 'but' and 'and', or the importance of avoiding sentences ending with prepositions. Sir Winston Churchill has nailed that one for all time with his classic comment, 'this is the sort of nonsense up with which I will not put'.

The observation of such rules as those mentioned above would not help the aeronautical engineer of a large and famous aircraft firm who writes in this manner:

However, in connexion with the canopy/fuselage fit, it has been disclosed that when the w/screen casting is received as a separate unit to the rear framework, the juncture of the two parts on each side often forms a step in the face mating with the woodwork. Further work is therefore needed to 'blend' the joint, before fitting and the situation is mentioned here so that consideration may be given to the question of the service being confronted with such a predicament.

Nor would blind rules have helped this chemical engineer:

The third digester batch in No. 7 digester was then got ready for pumping in the early hours of 25 March, but when the run-off valve was opened, no liquor was obtained. After stripping down the run-off system it was found that the run-off branch was choked completely solid with half-digested mass which no amount of rodding or steaming would clear. It was then decided to cut the back line and run-off by hose through this, then, having emptied the digester, alter the run-off system to common the back line and

run-off line upstream of the back line valve. This is a variation from the West digesters where the back line valve and run-off valves are on the same T-piece but the open end is to the digester base and not the back line, but was thought to be expedient as it would give a means of clearing the run-off line if it were to choke due to liquor backing up during reduction.

Reasons for poor report writing

Why do people write in such a manner? I have suggested that English training ends too early. That is only one factor. The engineer from the aircraft firm does not write like this when he writes to his wife or his parents or his friends. He may defend technical writing of this order on the grounds of the complexity of subject matter, but it is also a jargon which is assumed for 'official' occasions. Its counterpart is still to be found in what is mistakenly known as 'Commercial English', with its letters to hand with thanks, your goodselves, and similar twaddle. There is only one English and that is good clear English. Another reason for the adoption of language such as that in the example of the aeronautical engineer is the curious idea that objectivity can be only established by writing impersonally, that any intrusion of the observer somehow invalidates his findings.

Not infrequently the writer adopts vagueness in the belief that he is being diplomatic. No one can pin him down if he is oblique. Equally he may play it safe and indulge in euphemism and circumlocution so as not to hurt feelings or incriminate other people. Truth in fact drains out of many a report as it works its way up the management ladder. The net result is bad English.

The aeronautical engineer has written as he has partly because he has rarely thought of an audience, so preoccupied has he been with wrestling with his subject, and partly because he has never really thought of the impact of words. What image do the words and phrases – 'situation', 'consideration', 'confronted with such predicament' – conjure up in the mind? The chemical engineer was cramming too many actions into one

sentence and using specialist jargon. The difficulty of writing reports, therefore, arises from a failure to understand the nature of communication itself and a failure to come to grips with the human and organizational problems to be found in most firms.

The nature of communication

To effect real communication means thinking much more of the reader and much less about personal satisfaction. Transmission is an easy thing to effect. The B.B.C. does this on the largest scale every day of the year. But how much does it communicate? Those of you who use another channel will say 'not at all': and even those of you who remain faithful throughout the day will record varying degrees of reception. Success of communication depends ultimately on the reader's or listener's response. Genuine communication can only take place on the basis of common experience and knowledge.

If you disregard written communication for the moment, you will appreciate that communication can take place at a variety of levels and in different ways. Obviously the dark auditorium and the brilliantly spotlit arena, the gleaming black shirts and breeches of the Nazis, the stirring Wagnerian music, beamed out powerful messages before Hitler even opened his mouth. So by our hair style, our clothes, and our accent, we too, without being conscious of it, can produce attitudes of approval and disapproval in our audience, which will effect the reception of what we have to say.

We can use a variety of media to convey our information. Our government publishes innumerable White Papers. Dr Fidel Castro prefers to rely on television, a highly sensible method to adopt for a largely illiterate people. In the firm how do you go about conveying information? By telephone? Over the office desk? By a notice on a board? By a memorandum? How often do you think of the nature of your information and how appropriate are the means you use? A perusal of many notice-boards would suggest that there are still many lessons to learn. The Trade Unions, to judge from the drabness of some of the journals they produce, seem typographically to be still living in the