first year students whose first language was Miranda. Some of the reasoning necessary for good programming might have come from the Miranda course, which is all to the good. However, perhaps that is the reason for the sudden and unexplained appearance of ∀ on page 96. Given the right context, I would have liked more such specification. Unfortunately, one cannot assume that context.

Each chapter is introduced well. It would help to have a summary of the notions he deals with at the end of each chapter, particularly in so very linear a book.

Two major developmental notions are introduced and then dropped. I agree that Design Structure Diagrams can be a useful tool. Winder's treatment in the chapter on Sequence, Decision Making and Iteration is very lucid. The technique should have been used in later chapters as well. He introduces complexity at the end of that chapter, and again, does not use it in the rest of the book.

There are some minor points. On page 104, Winder uses the fact that the && operator, unlike most operators, defines its order of evaluation; a note that this is dangerous is buried on the bottom of page 105. The functions on page 129 should return **void**. Chapter 11, Dynamic Data Types, is too long (as Winder states). Perhaps he could insert a separate chapter with the extended example.

The book has a very good set of exercises. It could do with a few more. They are scattered through the text, elucidating the idea at that point in the text. They are all answered in the back of the book. I also particularly appreciated the very good annotated bibliography. The annotations have clearly been coded. It is easy to see which of the entries Winder dislikes.

This is a good text that will appeal to serious beginners. It will help them travel well down both the roads of software development and C + + technique.

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P. K. MCBRIDE
C CLEARLY: An Introduction to C Programming.
Blackwell Scientific, Oxford. 0-632-03395-9. £14.99 (Paper).

The rubric on the cover indicates that this book is suitable both for the 'absolute beginner' and for people 'experienced in other languages'. I felt that a novice programmer would quickly be lost and that a significant background in programming is essential to understand the book fully.

All aspects of C are covered in no more than 200 pages and the style is very concentrated. The text is liberally sprinkled with interesting examples, most of which are of technical interest to computer scientists, and topics such as sorting arrays and implementing stack and trees are covered. The examples are clear and

easy to follow, though an unusually small font was chosen for the segments of code and for that reason I found it tiring to read.

The book commences with a discussion of simple programs with rudimentary input and output, building on this to introduce conditional expressions and loops. Functions are then discussed, followed by complex data structures. The author then returns to the topics introduced previously and discusses them in greater detail. Pointers and strings are covered last, and this part of the text I found quite hard. However, several sizable programs are included which, although themselves moderately complex, are well set out and straightforward to follow.

In the first appendix, a list of the standard library of C predefined procedures and functions is provided. Where appropriate, a back reference is made to where they were introduced earlier in the book. In two further appendices general rules and hints are given for translating programs written in Pascal or BASIC to C.

I felt that too much material was compressed into too small a book. If you have programmed in Pascal or Basic, then this book will help you to convert to C quickly; if you have never programmed before, it is probably not a suitable first text. Nonetheless, it is reasonably priced and good value.

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DON LIBES
Obfuscated C and Other Mysteries. Wiley, New York. 0-471-57805-3. US $39.95 (Paper).

Over several years a competition has been held annually called the 'Obfuscated C Code Contest'. The purpose is for competitors to write programs in C whose function is as obscure as possible to someone reading the source code for the program. This has produced many programs which are extremely difficult to decipher, even for the most experienced C programmer.

This book documents the 'winning' entries for the competitions from 1984 up to 1991, and discusses each in detail. Without exception, each is fascinating and will keep the reader spellbound for hours as they first attempt to work out what it does, and then read the explanation provided. However, this book is not just for fun! The examples from the competitions are used to illustrate and to introduce many serious C programming techniques, such as using pointers to functions or trapping signals.

At 400 pages the book is big and not cheap, but is worth every penny, and comes equipped with a disc (for a PC) containing the programs listed in the book. If you program in C at all, you will thoroughly enjoy this book. If you are an expert C programmer, you will be fascinated by the variety of abuses of the language. If you value the good programming techniques espoused