Bashing the British System of Units

"I have felt constrained to use the archaic British units of measurement, as the unfamiliar metric terminology would have distracted the attention of the majority for whom this book is intended, who have spent untold hours that might have gone into mathematical or general education in performing ridiculous operations such as reduction, compound multiplication and practice which our British methods of measurement necessitate, but which in more enlightened countries are wholly unnecessary."

C V Boys, in his preface to the new and enlarged edition of the book 'Soap Bubbles'.

lude. His expositions on curves generated by the focus of a conic section as it rolls on a straight line are very illuminating. One effortlessly learns a lot of geometry relevant to the shapes of the bubbles.

Now about the Indian edition of this marvellous book. I could not lay my hands on the first edition of this monograph. However, I have gone through the 1920 edition and find that the Indian edition agrees with it in many respects. The Department of Science and Technology which financed this venture should be congratulated on undertaking such an activity. Also its decision to publish at a low price is truly commendable. Unfortunately, the Indian edition is not a good representative of the original monograph in some respects. The editors could have handled this task with a little more care. They provide their own 'explanatory notes' towards the end of the book. Some of these notes are even misleading. For example it has been stated that a gold-leaf electroscope detects radiation while in fact it can only detect ionizing radiations. The text needs the geometrical dimensions of shillings, etc, and not their monetary relationship with the British Pound. Further, Figure 17 is not consistent with the text pertaining to the instability of a rotating liquid drop.

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Complex Function Theory

A Concise and Interesting Book!

Gadadhar Misra

Notes on Complex Function Theory
Donald Sarason
TRIM #5, Hindustan Book Agency,
New Delhi 110 017. 1994.
pp 184. Rs 180.

Over the last few years, there has been a substantial increase in the number of text books on complex analysis. Most of these texts have common core material. There is no serious disagreement at present about the logical order in which this material must be presented. Besides, elegant and economical proofs have been found for most of the important results. This makes the task of writing a new book on complex analysis at an elementary

Within the limitations of space the book has an amazing amount of material. The proofs presented are complete and rigorous.

level all the more difficult.

Notes on Complex Function Theory by Donald Sarason is written in a clear style which is concise and interesting. The material is well organised and is presented in a natural sequence.

From the seemingly innocent definition of a holomorphic function, a student often wonders if much of complex analysis is similar to what one has already learnt in real variable theory. She is surprised by the many differences that she encounters between a holomorphic function and a differentiable function of two real variables. The list keeps growing, so much so, that after a while, it becomes impossible to keep track of all these! The book under review has about one hundred and fifty descriptive titles, each of which clearly indicates what is to come in the next page or two. This is certainly very helpful for someone learning the subject for the first time. Here is a sample that is hard to miss even at the first reading :

- (VII.8) Holomorphic functions are differentiable to all orders.
- (VII.13) Holomorphic functions, all of whose derivatives at a point vanish, are identically zero.
- (VII.14) Two holomorphic functions which agree on an open set are identical.

The book begins by clearly explaining the difference between real and complex differentiability. The branch of a logarithm is discussed in detail and is followed by a discussion of analytic continuation. The Riemann surface associated with the function $z^{1/2}$ is constructed. A brief discussion on power series follows. Cauchy's theorem is first proved for a convex region. Cauchy's integral formula is then derived from this. Laurent series and the discussion of poles, singularities , etc. occupy the next chapter. Simply connected domains are introduced via the winding number criterion and then a more general version of Cauchy's theorem is proved. An interesting alternative proof of Cauchy's theorem is provided using Runge's theorem.

The Riemann mapping theorem is presented at the end. (Of course, this is one of the main theorems proved in any serious first course on complex analysis. However, a lengthy discussion on 'normal family' and the lack of motivation for the proof usually combine to discourage a student from learning the proof.) Sarason's book first isolates an extremal property of the Riemann map. The proof is then given in three clear cut steps: 1) existence of a univalent (one-to-one) holomorphic map of the given simply connected domain into the unit disk, 2) existence of a map with the necessary extremal property, 3) proof that the map so obtained is the required Riemann map.

Within the limitations of space (less than two hundred pages) the book has an amazing amount of material. The proofs presented are

There are perhaps a lot of topics that could be added to the book but there is hardly anything that could have been left out!

complete and rigorous. There are perhaps a lot of topics that could be added to the book but there is hardly anything that could have been left out! However, a list of books for further reading should have been added.

This book will be most valuable for students at the second year M.Sc. level or the first year of a Ph.D. programme.

After completing a course from Sarason's book, a student will be able to study any one of the following books. These discuss related material at an advanced level.

Suggested Further Reading

L V Ahlfors. Conformal Invariants; Topics in Geometric Function Theory. McGraw Hill.1973.
This book is recommended for a student interested in Riemann surfaces.

S D Fisher. Function Theory on Planar Domains; A Second Course in Complex Analysis. John Wiley & Sons. 1983.
This book is for any one interested in operator theory, H^p spaces etc.

R Narasimhan. Complex Analysis in One Variable. Birkhauser. 1985.
This book serves as good preliminary reading for someone interested in complex analysis in several variables.

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Another Uncertainty Principle ... As far as the laws of mathematics refer to reality, they are not certain, and as far as they are certain, they do not refer to reality. - *Albert Einstein.*

Otto Warburg's reply ... A journalist once asked Otto Warburg : 'People say that you are a great scientist but a rotten human being. What is your reaction?' Warburg's reply: 'I am glad that they do not say the other way around.'

Deceit in History ... John Dalton, the great nineteenth-century chemist who discovered the laws of chemical combination and proved the existence of different types of atoms, published elegant tesults that no present-day chemist has been able to repeat (from *Betrayers of the Truth* by W Broad and N Wade).