PÓLYA AND SZEGÖ'S PROBLEMS IN ANALYSIS

Aufgaben und Lehrsätze aus der Analysis. By G. Pólya and G. Szegö. Berlin,
Julius Springer, 1925. vol. 1, xvi+338 pp; vol. 2, x+407.

There are but few books which could be compared with this one as to
the richness and charm of material, and amount of suggestions which an
attentive reader is able to get out of it. The purpose of the book, and hence
the material and its treatment, is quite different from those of numerous
collections of problems already existing. The mere development of tech-
nique is of secondary importance with the authors: their main efforts are
directed rather toward cultivating good habits in the mathematical think-
ing of their readers. The reader is constantly urged to give his attention
not only to *what* he is being questioned about, but also to *how* and *where*
he is questioned. Accordingly the most essential feature of the book, and
one to which the authors gave much care, is the relative order of the
problems. Isolated problems and examples comprise but a small part of
the book: usually the reader has to deal with sets of problems, each of
which is devoted to an independent and more or less substantial notion
or question.

The material treated in the book (see the detailed list of contents below),
is taken from the modern parts of the classical theory of functions. This
choice seems to be the wisest, because it not only agrees with the personal
taste of the authors, but it also is fitted for the purpose better than any
other part of analysis: it gives an adequate idea of the modern devel-
opment of the science without being so abstract as to scare a beginner, even
an advanced one. As sources, the authors use to a great extent recent
memoirs. Many a problem has been communicated to them by different
mathematicians as well as those personally found, and appears in print for
the first time. There is no doubt, therefore, that the book may be of great
value to specialists as well as to beginners.

The first volume is devoted to the fundamental notions, while the second
volume treats of questions of a more specialized type.

Volume I contains three sections:

Sec. I (Chapters 1–4) Infinite Series and Sequences.

Sec. II (Chapters 1–5) Integral Calculus.

Sec. III (Chapters 1–6) Generalities on Functions of a Complex Variable.

Of these: Chapters I, 3 (the Structure of Sequences and Series of Real
Terms); II, 1 (The Definite Integral as a Limit of Sums of Rectangles);
II, 3 (Inequalities); II, 4 (Different Kinds of Distribution, i. e. Multiples
of an irrational number, distribution of digits in a logarithmic table, etc.);
II, 5 (Functions of Large Numbers); III, 3 (Geometrisches über den Funk-
tionsverlauf); III, 4 (Cauchy's Integral and the Principle of the Argument);
III, 6 (The Principle of the Maximum) are of extraordinary interest and
value.