BOOK REVIEWS

Polynomial expansions of analytic functions. By Ralph P. Boas, Jr.
and R. Creighton Buck. Ergebnisse der Mathematik und ihrer
Grenzgebiete, New series, No. 19. Berlin, Springer, 1958, 8+77 pp.
Paperbound, $4.75.

This is an excellent little book written with a commendable atten-
tion to detail. The authors take pains to indicate frequently what is
going on behind the scenes and they include numerous pertinent and
useful illustrations of the theory. The book contains much new mate-
rial in addition to an organized treatment of known phenomena.

The work is motivated by a desire to examine in some detail the
fact that certain polynomial sets yield nontrivial representations of
zero. Boas and Buck find that, for a specified polynomial set, (a) the
nonexistence of such representations of zero, or (b) the existence and
enumeration of distinct representations of zero can be deduced from
properties of generating functions of certain forms. A very few mis-
prints were noted, none of them likely to disturb the reader.

Chapter I (about 20 pages) contains motivation of the study and
some underlying function theoretic results. A set of pseudo Laguerre
polynomials (superscript dependent upon the subscript) is used in
an illustration. A fairly general class of generating relations previ-
ously studied by Boas and Buck is introduced and the corresponding
polynomials are given the name generalized Appell polynomials. This
class of polynomials is to play a major role in the succeeding chapters.
On page 18 two problems, which have long confronted workers in the
study of generating relations for polynomial sets, are pointed out to
the reader.

Chapter II (about 27 pages) is a study of the representation of
entire functions by series of generalized Appell polynomials. There
are determinations of the existence of convergent, Mittag-Leffler
summable, or Borel summable expansions in such series. Numerous
useful illustrations are given. These include polynomials associated
with names Bernoulli, Euler, pseudo Laguerre, reversed proper La-
guerre (superscript independent of the subscript), Hermite, and a
rearranged form of Legendre polynomials. Additional application of
much interest is made to the Sheffer polynomials (Sheffer's type zero
classification) which include proper Laguerre polynomials, those of
Angelescu, Mittag-Leffler and Newton, the actuarial polynomials
and some others associated with interpolation problems. Boas and