tage of this somewhat limited context to make a readable and enjoyable presentation.

The book covers most of what is important in classical potential theory. For a definition of "importance" the reviewer used the book *Introduction to potential theory* by L. L. Helms. Almost every fact in Helms' book can be found in Port and Stone, and a comparison of the two books is interesting. For example, in the probability approach one writes down more or less immediately a solution of the Dirichlet problem in an arbitrary domain, while the classical approach starts more slowly with a ball and Poisson's integral formula. However by the time the treatment via probability is complete, including irregular domains, discontinuous boundary functions and exceptional boundary sets, it is just as long as the complete classical treatment. In fact the two books have the same length, so that some "conservation" principle is at work.

The listed prerequisites–knowledge of real variable theory plus a graduate level probability course–are more than adequate. It would have been feasible and appropriate to include exercises, especially since many people come to this subject considerably more familiar with one side than the other.

A moderate-sized book cannot contain everything. Some omissions on the potential theory side are the fine topology and the Martin boundary. Both topics would have fit in nicely: the probability approach leads to a very nice definition of "finely open" set, while the symmetry of the Green function eases the difficulty in proving the fundamental fact that the process converges to the Martin boundary. On the probability side the most important omissions are multiplicative and additive functionals, the latter being the sample function analogue of measures with finite potential.

In summary, this book is an attractive introduction to probabilistic potential theory. Readers who wish to learn important probablistic applications of the theory should next tackle the challenging *Diffusion processes and their sample paths* by Itô and McKean.

R. M. BLUMENTHAL

BULLETIN (New Series) OF THE
AMERICAN MATHEMATICAL SOCIETY
Volume 2, Number 3, May 1980

0002-9904/80/0000-0213/$01.75

Convexity and optimization in Banach spaces, by V. Barbu and Th. Precupanu, Sÿthoff & Noordhoff International Publishers, Alphen aan den Rijn, The Netherlands, 1978, xi + 316 pp.

The objective in studying abstract optimization problems is the development of a comprehensive theory that will contain specific optimization problems as special cases. Today, the mainstream of research in this area results from the confluence of developments in optimal control theory and in mathematical programming. Optimal control theory, in turn, encompasses much of the classical calculus of variations.

The calculus of variations originated in 1697 with the solutions of the brachistochrone problem by John and James Bernoulli. From then onward, the calculus of variations was a central and vital subject in mathematics. By