Methods of optimization, by G. R. Walsh, John Wiley and Sons, London, New
   York, Sydney and Toronto, 1975, x + 200 pp., $19.95.

The book is concerned with the very large number of computational
methods that have been developed in recent years to deal with what is, in
theory, a rather simple problem of elementary calculus–finding the maxima
and minima of a function of several variables, with or without constraints. It
is customary to assert that this is a new problem, never considered by Euler
or Lagrange, because the constraints are now inequalities as well as equalities.
(In other words, these mathematicians were unable to solve the equilibrium
problem for a table standing on the floor, because the table was free to fly up
into the air!) However what matters is that most of the methods are new, and
they are what the author is concerned in making intelligible.

The book is based on undergraduate lectures in the practical North of
England. Therefore "methods" are understood to be practical methods for
solving no-nonsense problems, and the author's main purpose is to teach the
reader to use them by providing him, at the end of each chapter, with many
problems, most of which can be solved without the aid of computers. The
problems are usually already expressed in mathematical symbols, but towards
the end of the book they concern potato growing, minimal paths in networks
(traffic), and policy problems relating to allocation of resources. All the
problems illustrate methods given just before, so that the student is spared the
embarassment of having to choose which method to apply. However–for
problems encountered presumably elsewhere than in the book itself–some
rather noncommital advice is given in regard to the choice of a method.
"Steepest descent is not recommended because of poor convergence." Another
method "works particularly well if . . . ", however it "may fail to converge, and
may pose formidable computational problems".

A mathematician will be disappointed to see, in this no-nonsense book
without frills, theorems purposely misstated, and the necessary qualifications
given only at the end of the "proof", where we are suddenly informed that all
is invalid if . . . , and that the theorem is then false. However, since the
irritatingly simplified presentation is enlivened by alternatively homely and
exciting terms, such as hemstitching, the golden section search, and penalities,
one is left with the hope that it may go some way towards dissipating the terror
inspired by the word "optimization" and by the image it conjures up of a
surrender of vital human decisions to a yes-no mechanism feeding on the
soulless triviality of mail-box trash, that claims to take only a few minutes of
one's time.

L. C. YOUNG