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Companion to concrete mathematics, Volume I: *Mathematical techniques and various applications*, Volume II: *Mathematical ideas, modeling and applications*, by Z. A. Melzak, John Wiley & Sons, Inc., New York, 1973, xiii + 270 pp., \$ 14.45, 1976, xvi + 413 pp., \$29.95.

When these books (I and II) were first publicized, I has looked forward to obtaining them. Subsequently, after having skimmed through them, I felt that they were a very worthwhile addition to the literature especially in "Problem Solving". For a charming description of mathematicians as problem-solvers or theory-creators, which should give the right perspective in viewing these books, see Halmos [1]. As I more or less expected, there was much material and "tricks" which I was quite familiar with as a problem-solver. However, as a bonus there were variations and references on some of these which were new to me. Also, there was quite a bit of other material which was new to me. Consequently, at this time, I essentially agreed with a complimentary capsule review [2] of I which described it as "A delightful miscellany of problems". Additionally, I was very glad to get the publisher to denote copies of I to the top eight winners of the Fifth U.S.A. Mathematical Olympiad of 1976 (an annual high school competition of which I am chairman of the examination committee). One of the winners, a bright sophomore, wrote back to me that he found the book very interesting. Also, recently, J. Wiley has presented copies of II to the winners of the Sixth U.S.A. Olympiad (Springer-Verlag presented copies of G. Pólya, G. Szegő, *Problems and theorems in analysis*. I, II, books which I will be contrasting with the present ones, subsequently).

When I was asked to review these books, I agreed to do so, primarily, since I would then have to go through them much more thoroughly and hopefully would come up with some more interesting mathematical results which were new to me. I consider any day well spent, mathematically, if I come across even one result, proof or conjecture, mine or others, which is elegant to me. After having read the books more thoroughly, I did find more elegant results, proofs and conjectures. The range and number of topics and problems treated is very broad and large. Unfortunately, this has a dual effect akin to the Heisenberg Uncertainty Principle. On one hand, there is more than enough material to be of interest to different classes of readers; relative beginners, mature practitioners, teachers and students, pure mathematicians as well as the applied ones, and for different purposes. On the other hand, consequently, the treatment leaves much to be desired. It is often too sketchy as well as very uneven in regards to the level of difficulty. In the prefaces, the author gives his reasons for writing the books (too much abstraction, not enough geometry, too little problem formulation, lack of intuitive appeal, etc., in present-day mathematics teaching) with which this reviewer certainly agrees (see [3], [4] and the references within). He also gives reasons for his type of treatment and I quote (this also provides a brief description of the books):

"It was then that the final character of this book suggested itself to me: a collection of some body of ordinary but attractive mathematics which would supplement standard courses and texts by stressing concreteness, formal