Inexpensive Reliable Composites—WAM '78

This issue contains papers from two of the several sessions sponsored by the Materials Division in the 1978 Winter Annual Meeting. One of these, "Material Selection and Design Criteria for Low Cost Composite Material," is of special note: it deals with non-metals. For an ASME Division founded (1927) to foster the professions of "Metals Engineering" this is sign of a purposeful broadening of scope to encompass this new and growing segment of the materials technology needed by mechanical engineers. The increasing number and variety of applications for lightweight, low cost composite materials has brought about the need for new material selection processes and design criteria. Due to the anisotropic and inhomogeneous nature of composite materials, it is no longer possible to employ the usual selection and design techniques suitable for the more homogeneous metallic alloys. In many cases materials have to be chosen and used without total knowledge of their engineering properties and performance characteristics. Complete test data and service histories are as yet unavailable. Therefore it is very important to establish sound, reliable selection guides and design criteria. The papers on pages 22–41 of this issue are a sampling of some of the new technology being developed for material selection and design criteria of low cost composite materials. Important material properties such as strength, stiffness, and fatigue are discussed, in the context of essential practical considerations such as cost, reliability, and processing conditions. We look forward to further communication of this growing field in this Journal.

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Best Paper Award

This issue marks the outset of year number six for this Section of ASME Transactions. In its second year, the sponsoring Materials Division Executive Committee, seeking to attract the best-possible papers to the Journal, instituted a special award. Called simply its "Best Paper Award," it honors the authors deemed to have contributed the preeminent paper of a given volume or calendar year. The selection procedure, once all issues are published, involves a screening by the Journal's editorial board for several outstanding papers. Each associate editor may then cast a ballot, ranking these in order of his preference. The list of past winners, though not yet long, is pretigious:

1974 K. D. Ives, A. K. Shoemaker, R. F. McCartney, US Steel Research Laboratories.
1975 K. Masubuchi, T. Muraki, J. J. Bryan, MIT
1976 R. Kumi, H. Okabayashi, M. Amano, Ishikawajima-Harima Ltd., Yokohama

The winner for 1977 is a paper derived from the extensive thesis research of a bright young PhD candidate of Professors Parker and Zackay at Berkeley: Dr. R. O. Ritchie. His winning paper, of the July 1977 issue, is entitled "Near-Threshold Fatigue Crack Propagation in Ultra-High Strength Steel: Influence of Load-Ratio and Cyclic Strength." Two other 1977 papers which rank high in the polling were also commended by our editors:

A. L. Gurson, Continuum Theory of Ductile Rupture by Void Nucleation and Growth: Part 1—Yield Criteria and Flow Rules For Porous Ductile Media, Jan. 1977, pp. 2–15.
R. L. Tobler and R. P. Reed, "Fracture Mechanics Parameters For a 5082-0 Aluminum Alloy at Low Temperature," Oct. 1977, pp. 306–312.

Dr. Ritchie is presently an associate professor in the Mechanical Engineering Department at MIT.