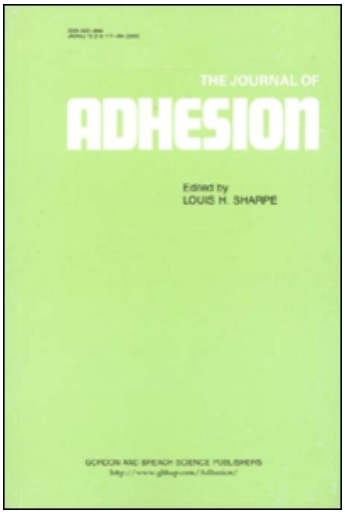

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Foreword

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Foreword

This special issue of the Journal of Adhesion honors John D. Venables, the 1991 winner of The Adhesion Society Award for Excellence in Adhesion Science, Sponsored by 3M. The adhesion community was invited to contribute articles relevant to John's work, especially those concerning surface treatments; surface interactions; bond durability in adverse environments; process development, optimization and control; and surface analysis. The articles contained here reflect the influence John has had in the field.

John was recognized "for contributions to our understanding of metal oxide morphology and chemistry with its implications for adhesive bond durability." Until his retirement in 1990, he served as the Corporate Scientist at Martin Marietta Laboratories, the highest scientific position in Martin Marietta. He pioneered the use of sophisticated analytical techniques, such as ultrahigh-resolution scanning electron microscopy, x-ray photoelectron spectroscopy, and Auger electron spectroscopy, to address problems in adhesive bonding and to advance the knowledge and understanding of mechanisms controlling bond strength and durability.

John is best known for his investigations of aluminum oxide surface morphologies. His micrographs and isomorphic drawings of the Forest Products Laboratory-etched (FPL) and phosphoric acid anodized (PAA) aluminum oxide surfaces and hydrated aluminum surfaces were among the first to depict accurately the detailed oxide morphology and have been widely reproduced around the world. The correlation of microscopic roughness with the durability of metal-epoxy bonds led him to be an advocate of the mechanical interlocking theory of adhesion.

His work on basic adhesion issues then evolved into investigations concerning hydration of aluminum surfaces. He concluded that the morphology and volume changes occurring during hydration of the oxide film would cause bond failure. Although the oxides produced by different adherend treatments hydrate at different rates, all eventually hydrate with concomitant bond failure. John and his group identified the mechanisms by which the oxides hydrate and developed a procedure to increase bond durability involving adsorption of a monolayer of a hydration inhibitor.

Within Martin Marietta Corporation, John's reputation was that of a fire fighter. In fact, his introduction to adhesive bonding was solving a production problem. He would assemble an *ad hoc* team appropriate to the specific problem and proceed to identify its cause and recommend a solution. His quick response and his ability to apply the knowledge obtained from basic research would repeatedly allow resumption of production, increased yields, and qualification or repair of suspect parts. In a sense, John is a Renaissance technologist who spans the entire realm of technology from basic research to process development to rapid failure analysis.

Finally, I would like to comment on another of John's roles—a mentor to young scientists. This one is not as tangible as the others, but more important in the long run. He has provided training, encouragement, and support for many researchers, including myself. He set the standard for good work and demanded it. John was quick to praise good work and provided constructive criticism to allow the protege to learn from his mistakes. He encouraged publications, arranged for invited presentations and other honors and, in general, advanced his proteges' careers.

In summary, John is eminently worthy of The Adhesion Society Award for Excellence in Adhesion Science, Sponsored by 3M. He upholds the high standards of the previous winners: Alan Gent, Ed Plueddemann, Fred Fowkes, and Bill Bascom.

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