Back Page

Humble giant of cascade impactors, Virgil A. Marple August 16, 1939 to December 24, 2017

Daryl L. Roberts, PhD, Applied Particle Principles, LLC
Jolyon P. Mitchell, PhD, FRSC(UK), CCHEm, CSci, Jolyon Mitchell Inhaler Consulting Services, Inc.

We count ourselves unbelievably fortunate to have worked with, been mentored by, traveled with and laughed with Virgil Alan Marple over a significant portion of his professional career. He once said "the only thing I can't do is design an impactor incorrectly," an observation made in passing to the executive committee of the Next Generation Impactor (NGI) Consortium. This remark did have, and does have, full credibility. It was not a boast but just his true understanding of impactors combined with his commitment to achieve the highest technical quality.

In his PhD thesis, Virgil was the first to capture the fundamentals of the multi-stage cascade impactor in a quantitative manner. He subsequently trained numerous graduate students as well as entire technical populations, such as the inhaler testing community, in proper impactor design.

His creations for the inhalation community include the adult and pediatric Marple-Miller impactors and most recently the NGI. The quality and performance of the NGI has won over the inhaler testing community, well past the original dreams of the NGI consortium, to the benefit of thousands of users and ultimately to the benefit of the populations worldwide needing inhalers to manage respiratory diseases. In addition, his impactor design expertise has had a major impact in the field of environmental assessments associated with nanometer-sized airborne pollutant particles. He created the series of Micro-Orifice Uniform Deposit Impactors (MOUDIs), and even his wood-chip sampler—the Marple 290 personal impactor—was adopted later for nebulizer testing.

We believe that Virgil's intuitive feel for practical designs stemmed from his youth on the family farm in western Minnesota, where one quickly learns to fix mechanical "things" and keep them running. His love of learning was evident as he attacked problems in a systematic and knowledge-centered way. We recall his ever-present napkin sketches of new ideas. These rapidly produced, informal yet informative, outlines stand in stark contrast to the way many of us tackle problems these days, often finding it difficult to function without a laptop.

His collection of more than 100 cars, kept on his farming and residential property in Independence, Minnesota, and never-ending fascination with cars were additional outlets for a brilliant mechanical mind. To him, driving 25 miles one-way to the University of Minnesota each day for more than 30 years was fun, not a commute.

Virgil leaves a love of life that we wish upon all. May we read, and heed, his gifts to us inside these seminal publications:

- Marple VA, A Fundamental Study of Inertial Impactors, PhD Thesis, University of Minnesota, September 1970.
- Rubow KL, Marple VA, Olin J, McCawley MA, A Personal Cascade Impactor: Design, Evaluation, and Calibration, Am Ind Hyg Assoc J, 48, 532-538 (1987).
- Marple VA, Rubow KL, Behm SM, A Microorifice Uniform Deposit Impactor (MOUDI): Description, Calibration, and Use, Aerosol Sci Technol, 14, 434-446 (1991).
- Marple VA, Olson, BA, Miller NC, A Low-Loss Cascade Impactor with Stage Collection Cups: Calibration and Pharmaceutical Inhaler Applications, Aerosol Sci Technol, 22, 124-134 (1995).

continued on page 31

Copyright CSC Publishing

- Olson BA, Marple VA, Mitchell JP, Nagel MW, Development and Calibration of a Low-Flow Version of the Marple-Miller Impactor (MMI™), Aerosol Sci Technol, 29, 307-314 (1998).
- Marple VA, Roberts DL, Romay FJ, Miller NC, Truman KG, Van Oort M, Olsson B, Holroyd MB, Mitchell JP, Hochrainer D, Next Generation Pharmaceutical Impactor. Part I: Design, J Aerosol Med, 16, 283-299 (2003a).
- Marple VA, Olson BA, Santhanakrishnan K, Mitchell JP, Murray SC, Hudson-Curtis BL, Next Generation Pharmaceutical Impactor. Part II: Archival Calibration, J Aerosol Med, 16, 301-324 (2003b).
- Marple VA, Olson BA, Santhanakrishnan K, Roberts DL, Mitchell JP, Hudson-Curtis BL, Next Generation Pharmaceutical Impactor: A New Impactor for Pharmaceutical Inhaler Testing. Part III. Extension of Archival Calibration to 15 L/min, J Aerosol Med, 17, 335-343 (2004).

Jolyon P. Mitchell, PhD, FRSC(UK), CChem, CSci is an Adjunct Professor at the University of Western Ontario, an Affiliate Professor at the University of Hawaii and CEO of Jolyon Mitchell Inhaler Consulting Services, Inc., 1154 St. Anthony Road, London, Ontario, N6H 2R1, Canada, Tel.:+1 519 472-5364, mitchelljolyon@gmail.com. Daryl L. Roberts, PhD is President of Applied Particle Principles, LLC, 17347 Westham Estates Court, Hamilton, VA, 20158, US, Tel.: +1 612 845-3293, droberts@particleprinciples.com, www.particleprinciples.com.