

# IN MEMORIAM

## GORDON LESLIE DUGGER

1923—1987

### **Carl O. Bostrom**

Director, Applied Physics Laboratory

For the last 30 years, Gordon L. Dugger devoted a large measure of his time and energy to the work of the Applied Physics Laboratory. His career at APL reads like a textbook example of the ideal professional scientist and engineer. His personal contributions spanned the gamut from basic research to engineering design and encompassed several areas of scientific and engineering activity. He was totally dedicated to his work and to his profession and gave freely and generously of his time and talents to serve as a leader in the national and international scientific communities concerned with combustion, propulsion, and energy. He chaired national committees, served as editor-in-chief of a major technical journal, and held office in national technical societies. He was the recipient of a number of awards recognizing his scientific contributions and was a prolific author with more than 100 publications and presentations to his credit.

At APL, his technical leadership was highly valued, and he became head of the Aeronautics Department in 1978. He brought the same level of dedication and care to his administrative duties that were hallmarks of his technical achievements. Words like devotion, dedication, and service accurately describe his commitment to his profession and to the Laboratory. He was a man of high principles that he applied uniformly in all his pursuits, but, at the same time, he was caring and compassionate in his dealings with people.

All of us suffered along with Gordon during his illness, but even when he was no longer able to work, his contributions to APL continued. His advice and counsel were invaluable. I was pleased to recommend Gordon for appointment as a Senior Fellow of APL, and he was appointed to that position by President Muller on February 1st of this year. It had been our hope and plan that Gordon would recover sufficiently to enable him to continue his illustrious career. He will be greatly missed and warmly remembered.

### **William H. Avery**

Senior Fellow; Former Supervisor, Aeronautics Department

Gordon came to the Laboratory just 30 years ago. APL would not be as successful an organization without his dedication to and outstanding leadership of our programs in aeronautics and energy during those years.

I met Gordon when he was engaged in combustion research at NACA's Lewis Research Center. His research was directly applicable to APL's programs in propul-

sion, and I believe our conversations then stimulated his first interests in ramjets. He left Cleveland to become supervisor of chemical process development at International Minerals and Chemicals in Florida, but after two years he decided in 1957 to come to APL to join our program. It was a fortunate move for us. He was intrigued by the prospects of hypersonic propulsion and immediately assumed responsibility for our work in that field. Under his leadership, the first experimental demonstrations of ramjet propulsion at Mach 7 were performed, and the acronym SCRAM was invented to stand for Supersonic Combustion Ramjets. Gordon's pioneering work established that field of technology, and his leadership of the continuing program at APL gained him and the program worldwide recognition. He and Fred Billig were awarded the Silver Medal of the International Combustion Institute in 1970 for their landmark paper on supersonic combustion. The current national interest in the aerospace plane derives directly from that basic work.

In 1973, the world oil crisis led us to identify ocean thermal energy as a promising technology to provide relief from U.S. dependence on foreign oil. With his usual keen engineering judgment, Gordon provided a solid foundation for our work in that field. His papers were not only technically outstanding but were models of good writing. He was organizer and chairman of the Third International Workshop on Ocean Thermal Energy in 1975 and was asked to play that role again at the Sixth Symposium in 1979. That was a monumental task. It was characteristic of Gordon that every paper of the 125 presented showed the beneficial results of his careful review.

My association with Gordon was a continuing source of deep enjoyment heightened by admiration for his engineering judgment, his thoroughness, his integrity, his generous help, and his dedication to the goals of APL. He was an outstanding person and a loyal friend. His life and his accomplishments will be a continuing inspiration to all who knew and worked with him.

### **James Harford**

Executive Director, American Institute of Aeronautics and Astronautics

Among the many volunteers I've worked with for more than 30 years as staff director of AIAA, and before then the American Rocket Society, are 34 presidents and over 100 vice presidents of membership, technical activities, public policy, international activities, education, and publications. I cannot think of anyone who

made a more sustained, more conscientious, relentless contribution to the Institute and to the objectives of the Institute to advance aeronautics and astronautics than did Gordon Dugger, who served as Vice President, Publications for four years.

He was the first editor of the *Journal of Spacecraft and Rockets* for seven years. He was many times an author or a reviewer. Recently I talked at length about Gordon with other staff members he worked with particularly closely: Ruth Bryans, Jerry Grey, John Newbauer, Norma Brennan. Here's what I heard: meticulous editor, careful scholar, patient and thoughtful human being, gentleman. He listened carefully, he questioned inconsistencies or possible exaggerations. He met obligations, budgets, schedules. He rarely needed follow-up.

Norma Brennan said:

Gordon personally edited every single manuscript submitted. Authors would tell him that they couldn't possibly shorten their papers, they were just "perfect as is." So Gordon would slash five pages and no one ever complained. He did surgery, sentence by sentence, word by word, clarifying syntax, eliminating jargon, modifiers, dangling phrases.

But to Ruth Bryans, when she retired from the position of AIAA director of publications, Gordon—master of literary condensation—wrote four voluminous pages longhand. *He* knew when it was important to go into detail. A quote from Gordon's letter to Ruth:

I count myself among the fundamentalists of AIAA. That is, those who consider the technical meetings and the publications to be the heart and soul of a professional society. We enjoy and benefit from the give and take at the meetings when we are in good company (such as yours). But the lasting record of the professional work in our fields is in the publications.

John Newbauer said:

He was, by all odds, the mainstay of AIAA's technical publications in the mid- and late-60s who undertook to rationalize the flow of papers into the right one of the three new journals that the American Rocket Society/Institution of Aeronautical Sciences amalgamation created: *AIAA Journal*, *Journal of Spacecraft and Rockets*, and *Journal of Aircraft*.

The technical work he did persistently in the 1950s and 60s in supersonic combustion and mixed cycle combustion now becomes, at the time of his death, one of the aerospace community's—indeed the country's—main technical interests with the development of the National Aerospace Plane. How splendid, how ironic.

## Fred S. Billig

Associate Supervisor, Aeronautics Department

**A Loving Husband, An Affectionate Father**—Some 42 years ago Gordon Dugger and his bride, Mary Louise, set out on the trail of married life to be joined by George and Susan and Barbara, and then, of course, Terra, Sarah, Michele, and little Benjamin, their proudest legacies.

**A Teacher, A Leader**—From instructor in engineering mechanics to leader of the Aeronautics Department. Who among us has not benefited from his gentle guidance, his technical insight, and his meticulous attention to important details we often had overlooked?

**A Master of Grammar, A Carpenter of Words**—His pride could not permit less than perfection in syntax and punctuation, whether it was an internal memorandum or an article for the *Journal of Spacecraft and Rockets*, while he was editor. It would be impossible to count the Sundays that Gordon spent in his relentless pursuit of perfection in every article published, only occasionally interrupted by the distraction of a completed pass by Sonny Jurgensen.

**A Versatile Professional**—He began his career in combustion research, became world-renowned as a pioneer in hypersonic propulsion, and then, turning his attention to address the energy problem, became a specialist in ocean thermal energy conversion. And true to the mark of a complete professional, he took the time to make unmatched contributions to the American Institute of Aeronautics and Astronautics and other professional societies.

**A Brave Man**—From his service in the United States Army to his acceptance, without lament or fear, of the inevitable consequence of his medical problems.

**A Brilliant Inventor**—I have no doubt that one day we will be able to enjoy the benefits of his most imaginative ideas, an "Orient Express,"—a National Aerospace Plane and a commercially viable ocean thermal electric plant.

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We take solace in knowing that from this day forth, as the journal of eternity is written, nevermore will there be a split infinitive or a missing comma.

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