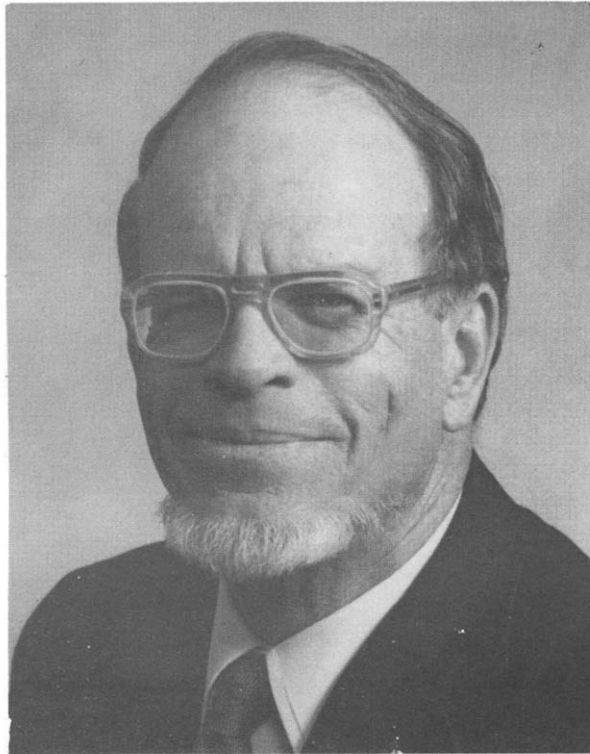


DR CARL GAZLEY, JR

ON HIS 60TH BIRTHDAY
AND
RETIREMENT FROM THE BOARD OF EDITORS



IN LATE 1958, Carl Gazley, Jr. and J. P. Hartnett wrote to a few friends asking whether a new international journal, devoted entirely to heat and mass transfer, might be appropriate. The response was encouraging. Thus was born the *International Journal of Heat and Mass Transfer*. Now after 24 years, Carl Gazley is retiring. This offers an occasion to note his contributions to the profession.

Carl and I were graduate students in the mid-1940s at the University of Delaware. Previously Carl had received his B.S. degree in 1943 at the University of Rochester. Then he worked on heat transfer as a research chemical engineer in Cleveland at NACA (later renamed NASA). He arrived at Delaware in 1945. An extremely active research program was in place, headed by A. P. Colburn. Graduate students often were thrown into whatever research problem happened to be most exciting or most urgent. It was not unusual for a student to be significantly involved in three or four projects before finally settling on a specific thesis topic. Carl worked for a time with A. P.

Colburn and E. M. Schoenborn on heat transfer from a heated cylinder to flowing boiling water — a very important problem with internal combustion engines. He then worked on combustion and diffusion flames with Kurt Wohl. Finally he worked on interfacial shear in two-phase flow with O. P. Bergelin. Carl co-authored papers on all these topics by the time he received his Ph.D. degree in chemical engineering in 1948.

Dr. Gazley's work on two-phase flow resulted in his great admiration for R. C. Martinelli, whose pioneering work even today is regarded as classical. Martinelli at that time had joined the General Electric Company so Carl also accepted a position at General Electric where he served 4 years doing heat transfer research applied to aeronautical engineering. In 1952 he took a position with the Rand Corporation where he continued until his recent retirement. His activities there included investigations of heat and mass transfer during atmospheric re-entry, hypersonic aerodynamics, and boundary layer characteristics, all im-

portant to successful space vehicle launching and recovery.

Dr. Gazley has a deep interest in the education of young engineers. He was a Lecturer at the University of California, Los Angeles from 1956 to 1958 and Professor in Residence there from 1966. He was a visiting Professor at Purdue University in 1970. He has been very active in professional societies and is a valued

member of the AIChE, ASME, ACS and AIAA.

It is a pleasure to express gratitude to Carl, his wife Joy, and their two children. May his retirement be a joyous one.

J. W. WESTWATER

University of Illinois at Urbana-Champaign

MY EARLIEST contacts with Carl Gazley, Jr. came in the mid-1950s when I tried to persuade him to return to General Electric. Instead, he convinced me that I should join him at Rand.

The professional community is well aware of Carl's technical expertise. He has applied his knowledge of heat transfer and fluid mechanics to many areas. In his early years at Rand he did pioneering work on missile re-entry and published a report that served as a definitive treatise on the subject. His interests continued in the general area of hypersonic aerodynamics and heat transfer. He did research and published original work on meteor, missile and spacecraft re-entry as well as work on boundary layer theory. As many others contributed and the field developed he continued to be a leader.

As illustrated by his work on re-entry, Carl has always been able to see the critical problems and choose the important areas of research. He not only worked in these areas himself but was instrumental in helping others to choose and be supported in pertinent research.

Carl Gazley was the leader at Rand in getting work started in areas that were on the leading edge. He is a keen observer of the world about him and has the courage to move off in new directions. Color vision and

fundamental nerve mechanism research are examples. Carl, himself, worked on the fluid mechanics of blood flow and color vision, and stimulated other's interests in similar areas.

In any institution, there is a formal organization chart that designates the official leaders. We all know that, in most efforts, the real leaders may not be recognized from the chart. Carl was one of the real leaders at Rand. We all knew that we could always count on Carl for good advice on which ideas were worthwhile pursuing and for a good critique of our results.

Carl Gazley attracted the best young researchers and outstanding consultants to work in the areas he perceived, correctly, as important. Carl Gazley, while internationally recognized for his personal technical contributions, must also be recognized for the encouragement, support and leadership he has given to others.

It is a delight to see that this issue of the *International Journal of Heat and Mass Transfer* is dedicated to him. A more deserving person could not have been found.

DAVID J. MASSON

Santa Monica, California

THE TOPIC of my first technical meeting at Rand in the summer of 1956, a year before Sputnik, reflected the technical level of Rand at that time: The Design of a Heat Shield for Recoverable Satellites. Carl Gazley was the leader of that group and I remember being impressed with the advanced subject of that meeting and reflecting on the great potential for creative work that existed at Rand. Carl had hired me as a summer consultant prior to my year in Europe as a Fulbright awardee. It was the auspicious beginning of a 15 year collaboration in solving a broad variety of problems ranging from re-entry vehicles and hypersonic flow to blood flow in the microcirculation. Carl was a leader in the area of re-entry heat transfer and had authored several papers on heat transfer on ablating surfaces. His interest in astronomy and meteor re-entry provided strong scientific inputs to that work. He was also keenly interested in color and the use of color as an image enhancement technique and, together with Joseph Sheppard, pioneered work in the application of

that technique for the interpretation of X-ray photographs. He showed a remarkable ability to isolate the key elements in a problem. His later work in microcirculation was characteristic; he studied the blood flow in a capillary using a simple but very informative model which is still widely used today.

Carl Gazley was my mentor at Rand for 15 years. He provided guidance, support and psychological re-laminarization in turbulent times. His clarity of thought and his ability to focus on the important aspects of a scientific problem were models for my own development as a scientist. I remember him most of all as a gracious person and a good friend. In a scientific era dominated by high-pressure, hard-sell proposals, accountants and research empire building, Carl Gazley is a member of a dwindling and perhaps endangered species: a gentleman and a scholar.

JOSEPH F. GROSS

University of Arizona, Tucson

CARL GAZLEY, JR.'s tenure at Rand spanned the 1950s, the 1960s, and the 1970s. During those three decades, Carl was viewed by Rand as a special resource, a leader and engineer of great soundness, depth and integrity. Carl's interests were wide ranging: heat and mass transfer, aerodynamics, hydrodynamics, astronomy, photography, bioengineering, optics, color discrimination, and medical imagery. Each of these interests led to productive work.

Carl's forté is a blend of analysis and communication; analysis based on fundamental principles and physical intuition, and communication based on colorful and lucid exposition. His pioneering studies of meteoroid, rock, and spacecraft heat transfer and aerodynamics were essential reading to designers of early thermal protection systems. The hypersonics course that Carl, Julian Cole, and Ed Williams taught at UCLA exposed many practising aerospace engineers to problems of high speed gas dynamics and heat transfer for the first time.

During the 1960s, Carl's attention was increasingly drawn to bioengineering, but he still played an active role in heat transfer and fluid mechanics research.

During the 1970s, his interest in boundary layer

transition was rekindled, and he chaired and collaborated with an expert group of engineers from industry, government, and academe who sought to delay the onset of boundary layer turbulence in water by such methods as body shaping, suction and surface heating. It is with a certain vividness that I recall my frequent visits to Carl's office where he was meticulously correlating theoretical velocity profiles with experimental data in order to understand the murkier aspects of boundary layer transition.

I close these brief remarks on a personal note. Carl Gazley was my mentor and colleague for nearly 20 years, years of enormous change in the conduct of engineering research. During those decades, I have never encountered such an exemplary combination of character and ability.

Should Carl's new life on the banks of the Sacramento river grow too placid, and the professional challenges and tumult of Santa Monica appear alluring by contrast, we would all be delighted to again benefit from the counsel and leadership of this remarkable man.

JEROME AROESTY
Santa Monica, California

IN THE fall of 1958 Robert Maxwell of Pergamon Press visited the Rand Corporation in Santa Monica where he met Carl Gazley. During that meeting the idea of the *International Journal of Heat and Mass Transfer* was born. I was fortunate enough to have been at Rand during that period on leave from the University of Minnesota. I can still recall their enthusiasm for this new project when they called me into the meeting and invited me to share in the organization of the journal. Thus it can truly be said that Carl Gazley was the initiating editor of the journal and his retirement from the Board of Editors represents a milestone in its history. Carl's retirement from the Board comes in the year of his 60th birthday so we pay homage to him on both counts.

Carl Gazley, Jr. was born on 7 August, 1922. He completed a baccalaureate in chemical engineering from the University of Rochester in 1943, followed by a Master's degree in 1946 and a Ph.D. in 1948, both from the University of Delaware, in chemical engineering. Carl worked for a brief period at Lewis Laboratory,

NACA (now NASA) Cleveland during the mid-1940s and with the General Engineering Laboratory of General Electric Company from 1948 to 1952. From 1952 until his early retirement in 1978 Carl was with the Rand Corporation in Santa Monica. The activities of Carl during this period are well covered by the comments of his colleagues Dave Masson, Joe Gross and Jerry Aroesty.

Carl's presence on the Board has been a stabilizing influence over the nearly 25 years of the journal's existence. Carl has rarely missed a Board meeting but 'more important' many of the ideas he has advanced at these meetings have contributed significantly to the development of the journal. Speaking for the Board of Editors, I want to extend our appreciation to Carl for his efforts on behalf of the journal over these many years and to wish him a joyous 60th birthday. We also wish him and his wife Joy many long and happy years of retirement.

JAMES P. HARTNETT
University of Illinois at Chicago