



September 1959 Volume 7, No. 9

APPLIED JOURNALS, ACS
1155 Sixteenth St., N.W.
Washington 6, D. C.

Director of Publications: C. B. Larrabee
Editorial Director: Walter J. Murphy
Executive Editor: James M. Crowe
Production Manager: Joseph H. Kuney

AGRICULTURAL AND FOOD CHEMISTRY
Editor: Rodney N. Hader

EDITORIAL HEADQUARTERS

WASHINGTON 6, D. C.
1155 Sixteenth St., N.W.
Phone REmpublic 7-3337 Teletype WA 23

Associate Editors: G. Gladys Gordon,
Stella Anderson, Katherine I. Biggs,
Margaret S. McDonald

Assistant Editors: Robert J. Riley,
Robert J. Kelley, Ruth M. Howorth,
Eugenia Keller, Sue M. Solliday,
Malvina B. Preiss, Ruth Reynard

Editorial Assistants: Katherine H.
Ginnane, Virginia E. Stewart

Layout and Production: Melvin D. Buckner
(Art); Betty V. Kieffer, Leroy Corcoran,
John V. Sinnett

BRANCH EDITORIAL OFFICES

CHICAGO 3, ILL.
Room 926
26 South Wabash Ave.
Phone STate 2-5148 Teletype CG 725

Associate Editors: Howard J. Sanders,
Chester Placek

Assistant Editor: James H. Krieger

HOUSTON 2, TEX.
718 Melrose Bldg.
Phone FAirfax 3-7107 Teletype HO 72

Associate Editor: Bruce F. Greek

Assistant Editor: Earl V. Anderson

NEW YORK 16, N. Y.
2 Park Ave.
Phone ORegon 9-1646 Teletype NY 1-4726

Associate Editors: William Q. Hull,
Harry Stenerson, David M. Kieffer, D.
Gray Weaver, Walter S. Fedor, Laurence
J. White

Assistant Editor: Louis A. Agnello

SAN FRANCISCO 4, CALIF.
703 Mechanics' Institute Bldg.
57 Post St.
Phone EXbrook 2-2895 Teletype SF 549

Associate Editor: Richard G. Newhall

Assistant Editor: Joseph Sturchio

EASTON, PA.
20th and Northampton Sts.
Phone BLackburn 8-9111 Teletype ESTN Pa 7048

Associate Editor: Charlotte C. Sayre

Assistant Editor: Joyce A. Richards

Editorial Assistants: Elizabeth R. Rufe,
Barbara A. Conover

EUROPEAN OFFICE
Bush House, Aldwych, London
Phone Temple Bar 3605 Cable JIECHEM

Associate Editor: Albert S. Hester

Advisory Board Raoul Allstetter, Everette
M. Burdick, George K. Davis, George C.
Decker, Leo R. Gardner, Joseph W. E.
Harrisson, Lloyd W. Hazleton, William L.
Hill, Allen B. Lemmon, Maurice H.
Lockwood, Louis Lykken, George L.
McNew, Olaf Mickelsen, Harvey K. Murer,
Joseph A. Noone, J. D. Romaine, Warren
C. Shaw, A. V. Slack, Hazel K. Stiebeling,
John C. Sylvester

Advertising Management
REINHOLD PUBLISHING CORP.
(For List of Offices see page 653)

Out-of-This-World Research

SPACE TECHNOLOGY moves on apace. Earth satellites have become commonplace. It has been less than two years since Soviet scientists succeeded in placing the first man-made satellite in orbit; so many have followed it in the months since that the latest successful launching scarcely rated a headline in the newspapers, or a special news announcement on radio or television.

And space travel for earthlings, a subject discussed chiefly in science fiction until rather recently, is accepted by nearly everybody as a definite prospect for accomplishment in our time. The question is no longer "if," but "how soon?" Already, seven sturdy candidates have been selected from numerous volunteers for the first manned space flight, and they are undergoing the physical and technical training considered essential for extra-terrestrial success.

Scientists and engineers in this country and abroad have indeed made great strides toward solution of problems in space vehicle design, motive power, and instrumentation. Through development of new materials and new techniques, they have at least partly solved the problem of bringing a space capsule safely back to earth without destruction of itself or its contents.

Thus research has already gone a long way toward handling what might be called the inanimate aspects of space flight.

But the most important aspect of manned space flight is its animate aspect. And on this score, we have reluctantly concluded, research has not kept pace. This certainly is not the fault of those who are actively and intensively at work on research of this kind. It appears to be, rather, a result of having too few experts engaged in such research, with too little attention and support for programs that are at least as important to space flight as is the development of high-thrust engines and high-energy fuels.

Beginning on page 600 of this issue, the editors of *AG AND FOOD* present a brief but revealing special report on a problem of utmost importance to manned space flight—how to feed the astronaut. Fact and opinion for this report were gathered from the scientists who are actually working on the biological problems of space flight. Their comments were carefully sifted, and the resulting article has been reviewed and approved by scientists with first-hand knowledge of the research under way.

Without attempting to summarize their findings here, we should like at least to call attention to their views on the adequacy of the present research effort in space biology. An optimistic view is that if all-out effort were made, "substantial progress" would be evident in five years. A fairly typical comment describes the amount of money available for research in this area as "pitifully low." And one observer, who we hope proves to be pessimistic, states flatly that "at the current rate of research, there will never be a practical closed system for space travel."

One may argue the wisdom of or the necessity for extensive space travel by man. But if men are going to be sent on voyages into outer space—and there can no longer be much doubt that they are—then certainly the systems for maintaining their physiological well-being should be at least as highly developed as the mechanical and astronomical systems for moving them through space.

Much of the physiological and biological research required is of a nature that it should be done regardless of space programs. For whether or not a man ever sails out of this world and returns to tell us about it, mankind is faced with some very serious down-to-earth problems in human nutrition and food supply. They are serious in many regions now; they may be critical in every part of the globe within a few decades.

The most promising system to date for routine feeding of space travelers is a closed ecological system consisting of man and algae. It is no mere coincidence, of course, that algae are also receiving serious attention as a possible food source for earth-bound citizens. Effective research looking toward proper feeding of the astronaut could well play a most significant role in the future feeding of the people he leaves behind.