



MANUFACTURING CHEMISTS ASSOCIATION

1825 CONNECTICUT AVENUE, N. W. • WASHINGTON, D. C. 20009 • (202) 483-6126

WILLIAM J. DRIVER
President

RECEIVED

JUN 12 1970

R. FLEMING'S OFFICE

June 8, 1970

TO THE EXECUTIVE CONTACTS OF MEMBER FIRMS

Gentlemen:

Tracy
I believe you and your associates may be interested in reading the enclosed copy of the 1970 edition of "Catalysts of a Profession". The booklet, initially made available at the recent Annual Meeting, describes our College Chemistry Teacher Awards Program, presents sketches of the four new recipients, and contains the text of the provocative remarks offered by Dr. Eugene George Rochow, Harvard University, their spokesman at the Business session.

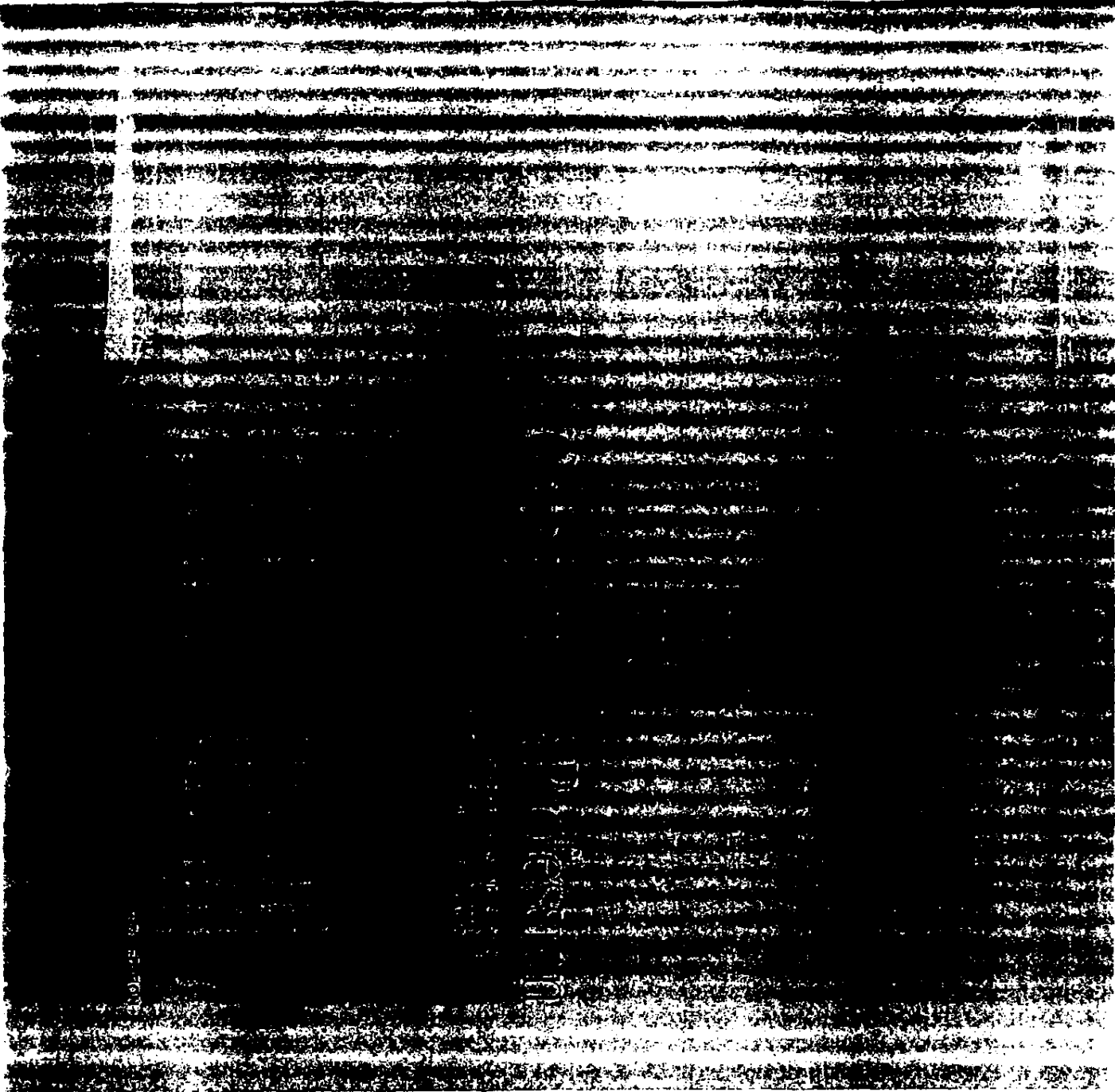
Distribution of the brochure is being made to all institutions in the United States and Canada offering programs in chemistry and chemical engineering. Should you care for additional copies, we would be delighted to provide them.

Sincerely,

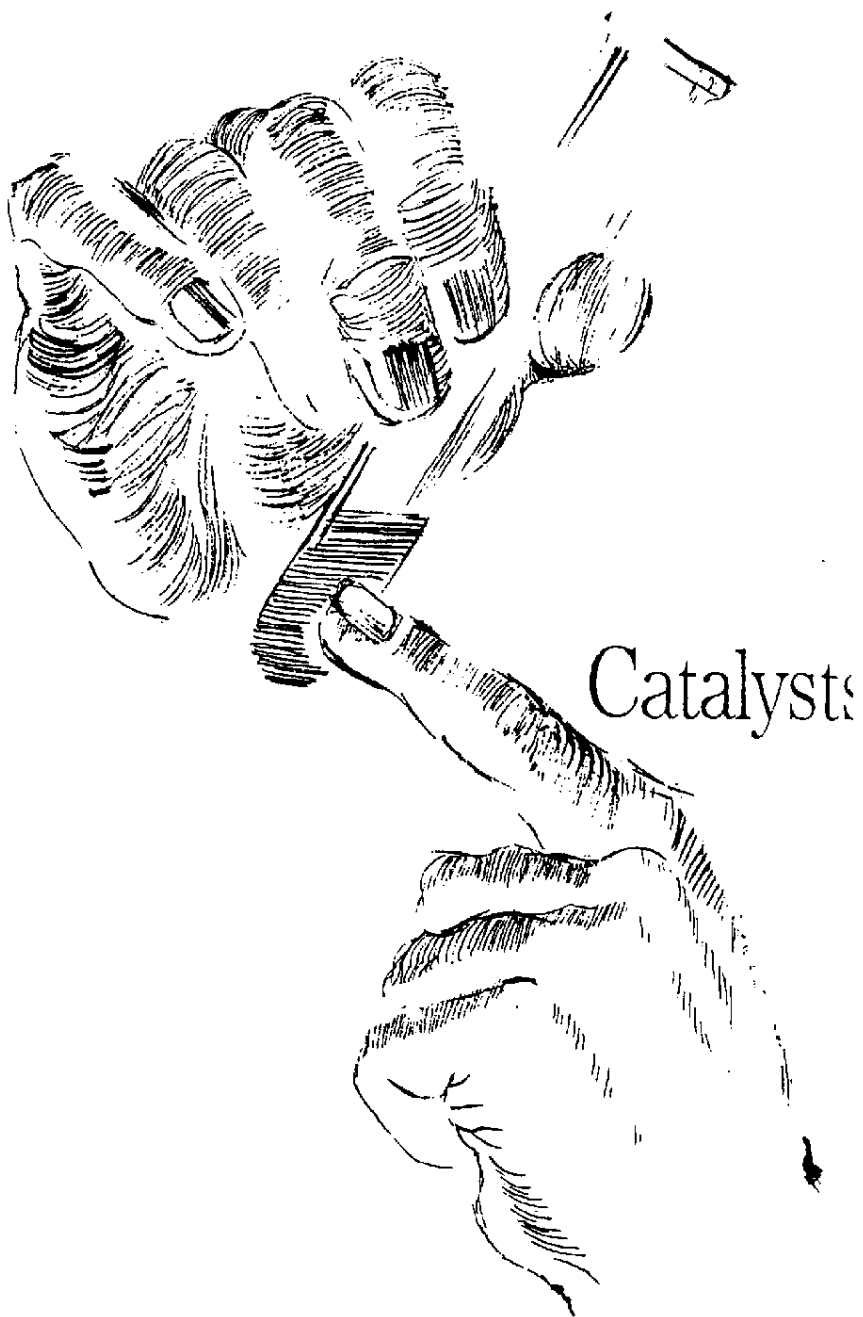
W. J. Driver
W. J. Driver

Enclosure

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AP00037171

of a Profession

AN UP-TO-DATE REPORT ON AN INDUSTRY'S
FOURTEEN-YEAR STUDY OF EXCELLENCE
IN CHEMISTRY TEACHING

1970 EDITION

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An Education Service
of the
Manufacturing Chemists Association
1825 Connecticut Avenue
Washington, D. C. 20009

A catalyst, according to one definition, is a substance which promotes a reaction without losing its own identity. We believe another definition should include human catalysts — people who have the precious power and skill to interest and to stimulate young, scientifically-minded students and transform them into men and women with a mission. But unlike the catalysts of the material world, they themselves become more valuable and more richly endowed in the process. It is to these thousands of catalysts, the outstanding teachers in the field of chemistry, that this booklet is dedicated.

Catalysts of a Kind

Since 1957 when the College Chemistry Teacher Awards Program was initiated, the Manufacturing Chemists Association has been directing public attention to these catalysts. For they are the key individuals in providing the talent so badly needed by education, government and industry. The sixty-five teachers chosen for the honors thus far are indeed outstanding people in their profession but they should also be considered as representatives of the thousands who perform in equally devoted and dedicated fashion.

Background of the Program

One measure of an industry's success is the quality of service it performs. That quality depends on the people it employs.

As the chemical industry has been called on for increasing quantities and kinds of products needed by a growing nation, the industry has needed greater numbers of highly qualified men and women. The source of such people is the classroom and the laboratory; the strength of the source is excellence of teaching.

In an effort to insure the replenishment and growth of this vital source, the chemical industry took an early lead in constructive concern for education.

In 1956, when only a perceptive few were acting on the problem—and before the rush to help had become a fashion—the Manufacturing Chemists Association began its broad-based program under the supervision of its Education Activities Committee. All the men who compose this group are representatives of MCA's member companies and are prominently identified with kindred activities in their own firms and in community education work.

Every project has been guided by these philosophies:

. . . Whatever is done in aid-to-education must be done in co-operation with educators.

. . . The industry can help most in areas it knows best.

. . . Its central effort should be to develop new materials and methods for use in teaching science.

. . . The program must not commercialize the material or

propagandize the students.

Within the boundaries set by these broad principles, the EAC has moved toward certain objectives which have remained unchanged since the program was begun:

. . . To improve understanding between those who teach science and those who apply it in industry.

. . . To help develop materials useful in teaching science and in explaining the use in industry of the scientific principles taught in school and college.

. . . To increase awareness of the chemical industry's role in the nation's economy and defense.

. . . To broaden the students' knowledge of chemical industry careers and to encourage qualified students to seek them.

. . . To identify outstanding teachers and to generate wide public recognition of their achievements.

In working toward these goals, the industry has developed and carried out a number of projects, including the production of experiments, books and booklets, films, and safety posters—all designed to facilitate teaching and stimulate learning—and all prepared with the advice and approval of distinguished teachers.

A most effective and gratifying feature of the industry's program has been its presentation of College Chemistry Teacher Awards. They are designed to honor outstanding teachers, to publicize the need for superior teaching, and to encourage truly qualified

students to plan careers as teachers.

In order to select recipients of the Awards, the EAC asks the heads of chemistry departments in institutions granting large numbers of advanced degrees, which colleges send them the best trained and most highly motivated students. The graduate department heads are also asked to name the college professors responsible for the outstanding students. The presidents of the colleges, in turn, are asked for supporting evidence on behalf of the professors.

The field is not limited to colleges named by graduate chairmen. Any president of any undergraduate institution can name a candidate. Every nomination must contain evidence that the candidate has been teaching at least ten years; and it must be accompanied by letters of endorsement from colleagues, former students, and others in related fields of science.

The judges—a panel of distinguished educators—seek teachers who have imbued students with an interest in chemistry, inspired them to serious intellectual effort, and nurtured the interest into a continuing dedication.

It has been said that the best teachers are young men and men who never get old—men who grow in knowledge without failing in spirit. Such teachers give to the world generation after generation of young people with the knowledge, judgment, and drive to perform superbly in the careers they choose.

One measure of a teacher's success is the quality of the students he has produced. This the chemist in industry understands, and this he honors with joy. It is to teachers of this quality—whose records appear on the following pages—that the Manufacturing Chemists Association presents its 1970 College Chemistry Teacher Awards. These men and women are the *catalysts* of their profession.

The more one studies a *master teacher* in action and reviews his achievements, the more elusive becomes his definition. So often a person, looking back on his academic career, expresses this sentiment about an instructor: "*The greatest teacher I ever had.*" Yet he finds it baffling to explain fully all the factors that led him to this appraisal.

In reviewing literally thousands of letters from former students and associates in support of candidates, the judges responsible for selecting the MCA Award recipients have found statements endlessly repeated such as these:

"... a brilliant lecturer and demonstrator"

"... interested in each individual student"

"... his profession is his life"

"... makes chemistry exciting"

"... tireless in promoting chemistry on the campus and elsewhere"

These attributes are credited to every one of the hundreds of professors nominated. So the job has been to dig deeper; to attempt to answer additional questions: What are the candidate's basic objectives in presenting his subject? His ideas concerning science—its methods and purposes? What evidence—statistical or otherwise—shows the candidate's role in preparing students for successful graduate study in chemistry or related sciences? How has he influenced other teachers? What has he done to bring chemistry teaching abreast of the times?

Even when the answers to these questions are complete, it is difficult to rank one above another. All are worthy of recognition.

The following brief sketches of the 1970 award recipients may provide further clues to the frustrating question: "*What makes a great teacher?*"

Profiles of MCA Award Recipients—1970

Eugene George Rochow

In a day when students are prone to evaluate their professors openly, it is significant that year after year this teacher's course receives the praise of the cantankerous authors of the "Harvard Confidential Guide to Freshmen" written by and for undergraduates.

The impression Eugene George Rochow makes upon his students is attributable, in part, to the fact that he has been constantly ahead of his times. Long before the nation became immersed in the furore over the environment he was stressing the social significance of science and the importance of ecological problems.

An innovator throughout his 22 years in Cambridge, he invites prestigious scientists to his freshman course as guest lecturers, transforms the review session before examinations into an open dialogue in which a synthesis of material takes place, polls students for suggestions to improve the course, and gives them a choice of subjects to be covered.



Innovations of this kind do not necessarily make a great course. Neither does the man who employs them become a great teacher. A former student observes: "The secret of the mastery of Eugene Rochow is really no secret at all. It is only that the telling is bound to be inadequate . . . I believe his mastery is a combination of at least two qualities possessed in full measure: the ability to communicate the subject to the tyro student and the art of projecting his personality so that it shines through the subject matter, illuminating both in a memorable image . . ."

Internationally known for his pioneering research—he is called the "Father of Silicones", this versatile scientist has also been a contributor to scientific education at home and abroad and a perennial speaker before high-school groups. All these and countless other achievements add to his stature as an outstanding ambassador of chemistry.



Robert L. Burham

No phenomenon in the education world is more impressive than the rapid growth of the two-year colleges. Its rapid pace, particularly in the field of chemical technology, has called for steady and wise guidance—guidance which Robert L. Burham has provided in good measure.

In the early days at Grand View College he played a leading role in designing and equipping its chemical laboratory; more recently he helped in planning its science-classroom building. His enthusiasm for sound teaching is paramount, however. The dedication of one of the college yearbooks cites "his abilities as a lecturer, his scholarship, his service to school and students and the respect of his colleagues . . ." Many of his students have continued on with advanced studies and hold important academic, industrial and governmental posts today. Despite all of his demanding responsibilities, he has found time for additional study, thereby making himself an even more effective teacher.

In off-campus activities, Mr. Burham has served unself-



ishly on the Two-Year College Chemistry Committee of which he is presently secretary. Through the leadership of this influential organization chemistry teachers in community institutions everywhere have become acquainted with sound curricula and have been introduced to the effective use of supplemental teaching tools such as audio-visual aids, auto-tutorial systems and computerized methods of analysis.

Mr. Burham has also been active in the programs of the Advisory Council on College Chemistry and the American Chemical Society's Teacher and His Work Committee. His interest in enlisting promising young people in the field of chemistry is demonstrated by his constant appearance as a speaker before high school groups and as a judge of science fairs.

In paying tribute to Mr. Burham the MCA honors not only him but also the growing number of outstanding chemistry teachers in the two-year colleges.



Howard Anthony Neidig

Here is a man whose activities appear to have touched every facet of modern chemistry teaching. His name and achievements are known to thousands of former students at Lebanon Valley College and to colleagues throughout the country.

For 22 years he has taught at his alma mater and one needs be on its campus but a short time to discover the importance of Howard Anthony Neidig in its total program. A dedicated professor, he kindles enthusiasm for learning. Few teachers are imbued with his talent for conveying the crucial essence of a complex subject or have his dramatic flair for lecturing. Few labor so closely with young researchers in the laboratory—with the "late bloomers" as well as with those of innate capacity. The success of his graduates in academic life, government and industry is a testimonial to his excellence.



In his quiet, self-effacing manner, Dr. Neidig has influenced the entire scope and quality of chemical education. Scarcely a conference for the development of courses or the design of laboratory experiments has been held where he has not played a key role. He has long participated as a committee chairman, adviser or worker in the councils of the Division of Chemical Education and the American Chemical Society. In America and overseas he has introduced new programs, notably the Chemical Bond Approach for high-school chemistry instruction. Through his efforts the horizons of education at every level have been widened.

A contributor to professional journals both as editor and as prolific author of scholarly papers, a skilled evaluator of research proposals, a source of counsel on a limitless frontier—these are attributes which, added to many others, make Dr. Neidig a towering figure in his profession.



Robert E. Treybal

The late Herbert Hoover once observed: "To the engineer falls the job of clothing the bare bones of science with life, comfort and hope . . ." The chemical engineer carries out this mission in superb fashion, making possible the fulfillment of Man's modern needs.

Thorough preparation of young people skilled in this rapidly changing field is essential and no one has excelled Robert E. Treybal in performing the task. For all 33 years of his teaching career he has served at New York University where his preoccupation has been in helping students to interpret and apply chemical science to practical advantage.

So effective have been Dr. Treybal's efforts that many of his graduates are now on leading college faculties; like numbers hold executive posts in chemical firms and government agencies.

A host of students have testified to the brilliance and

thorough organization of his lectures which arouse curiosity and a hunger for knowledge.

His teachings have been projected far beyond his own campus. Two highly regarded textbooks "Mass-Transfer Operations" and "Liquid Extractions", in numerous translations, have found world-wide use. His professional articles and papers are legion. Also, he has served on key committees of the American Institute of Chemical Engineers, the American Chemical Society and the American Society for Engineering Education. Despite his devotion to academic concerns, he has given many hours to consulting work and research and holds numerous patents.

For his varied achievements Dr. Treybal has already been granted highly regarded awards by other organizations. In presenting its College Chemistry Teacher Award to Dr. Treybal, the Manufacturing Chemists Association adds distinction to the roll of recipients.



Goodyear to Alexander Fleming, have found their luck in what are called "chance discoveries". No less important is the element of luck in the scaling-up procedure for a new process, and in the choice of men to run it. I suppose that much of marketing is luck, too, since it is dependent upon the whims of a fickle public. Mique Flett summed it all up a few years ago when he remarked, "Happy is the man who is associated with even *one* successful innovation in the field of applied chemistry!" I see his point; many chemists labor with devotion and skill, year after year, and yet never have found themselves in the winner's circle. They have advanced the cause of science and have contributed to the human storehouse of proven truth, but they never happened to be on the right spot at the right time to make the legendary Big Discovery.

Luck—Chance—Choice

"Ah", you will say, "but it is not enough to make a lucky discovery; one must have the training to understand what is going on, and the acumen to follow it up!". What you are pointing out is that *luck implies chance*, and *chance* involves choice: A new freedom of choice opens up when a "chance discovery" is made, and the successful inventor is one who can make the right decisions in following up his first observation. So it is with teaching: the teacher is trying to accomplish something new with the brains behind each new set of faces, and with a little bit of luck he can find a new way to do it. The world of the young is in a constant state of flux—a giddy whirl, some might call it. The only thing we can be sure of is that student attitudes constantly change. The born teacher instinctively notes what fluctuations offer new receptiveness, and hence new opportunities to get his point across, and instinctively he makes the right choices to accomplish his aim in the shortest time. He knows that if

* Address of the spokesman for the 1970
Award recipients at MCA's 98th Annual
Meeting.

he plods ahead on a predetermined plan at a measured rate he is going to lose the brightest minds through boredom, so he plays a game of wits with the smart ones and cajoles the rest into a game of follow-the-leader. Such a teacher is Leonard Nash, whose unique ability was recognized by this Association in 1966. I have had less opportunity to observe my three colleagues here today, but I suspect that they operate the same way. What do the rest of us do? I have to use a different system, one which could be called consumer testing. Starting with James Conant's dictum that the student is the sole judge of whether a course or a teacher is good or bad, and by asking often enough (in enough different ways) I know how things are going. I cannot understand teachers who resist student ratings and ignore the results; I would be lost without them.

Making Common Cause With the Young

We are now in the midst of enormous changes in attitude within the student age group. All of you know the reasons for these rapid changes, chief of which, of course, is the fighting of secret and undeclared wars, using in a grandiose manner under slogans of "power" and "avoiding humiliation" the bodies of young men who have no say in the matter, like pawns on a chessboard. These young people were raised in the belief that they lived in a democracy, and their sharp disappointment in finding neither political nor social nor economic democracy *for them* spills over into rage and frustration. But in their calmer moments they also are intelligent and well-informed people, so they set about devising ways to curb the major irritations and, eventually, to cure the world's ills. It will be a sad day for the world when no one wants to make things better!

So the winds of change blow strong, and the question

for us is, how can we best use the newly-presented choices to achieve greater harmony and more effectiveness? First, we should recognize that there is a greater interest in *practical* things, once more. It has a new name: relevance. It also has a new purpose: the young people want to learn what makes things tick in order to apply that practical knowledge to eliminating the pollution of the environment and the thoughtless despoiling of our limited resources. That is natural, for they have more at stake in how the world looks and smells fifty years from now than we do. We cannot expect our interests to coincide completely, but we would do well to understand the change in thinking, to welcome it, and to make common cause with the young people for many good reasons, chief of which is to bring them back into the fold.

Consider what has happened: In the days of the GI bulge in the colleges, the male students were earnest, settled young men who had been out in the world and who knew what they wanted. They responded to a practical approach, full of references to everyday experience and keyed to concrete suggestions for the advancement of their personal careers. They were exemplary students, and I am sure that they made excellent employees and then dependable administrators, later on. Then came the age of Sputnik, and we entered upon a furious renovation of schools and colleges, with strong emphasis on theory, on physics and mathematics, on *principles* entirely divorced from the real workaday world. Many teachers held that our salvation in the hectic race with the Russians lay in moving high-school studies into the grade schools, putting abstract college subjects into high school, and moving the senior course in physical chemistry into the freshman slot. At the same time, we relieved the students of all economic responsibility and all practical worries. In effect, we made disadvantaged

children out of them by depriving them of all necessity to struggle for a job, to think in practical terms, or to be connected with reality in any form at all.

Relevance Becomes the Watchword

What happened? An alienation of the young people, resentful of the pressure and thrashing about without any understandable aim. Escapism became rampant. A predecessor in this series of talks, only three years ago, deplored the divergent aims and actions on both sides of what he called the interface between industry and academia.* The policy of forced feeding of knowledge was a failure, yet there are still professors busily engaged in continuing it, trying now to force postgraduate-level thermodynamics and statistical mechanics into the freshman course. They are missing the turn of the road. The emphasis now is on *relevance to urgent present-day problems*, and any theory is an unjustifiable waste of time unless it can be demonstrated to have immediate helpful application to a sorespot. Yes, young people are interested in industry now, and are clamoring to get in; the shortage of jobs serves to heighten that interest. Young people are dissatisfied with the do-nothing universities, and want to go where the real action is: where things are designed, and made, and distributed for the consumer. They want to improve these processes, for the sake of their world and ours.

Tidying Up Our Own Spaceship

I can only applaud this change. I am delighted to find students responsive to lecture demonstration experiments, having had a surfeit of words; students interested in industrial processes traced way back to the earth, with supple-

* See O. T. Benfey, *Catalysts of a Profession*, 1967 ed., p. 20

ments explaining how the materials get back to earth or back to the stream of consumables again. What a welcome change, and how much we can do with it! Twenty years ago, on the occasion of the Backeland Medal, I pointed out how essential it was to use our material resources wisely and reversibly, aiming toward a human race living in a state of equilibrium with our planet. All the facts and figures were there, and suggestions for remedial action. What followed? My university colleagues not only were absent, they deplored my association with applied chemistry. Some leaders of industry remarked that it was the clearest statement of the case for conservation they had ever heard, but then proceeded to forget about it and do nothing. The popular press had a carnival (especially their cartoonists) ridiculing the idea that there might not always be ham and eggs to go around. "Harvard professor says we will have to eat our pajamas, and only rent the steel in our cars!"; went the headlines. Now an estimated 500 billion beer cans, 1100 billion non-returnable bottles, and 200 million dead automobile carcasses later, the public (*led by young people*) is beginning to wake up. Just beginning, though. This year 4,000,000,000 *aluminum* beer cans will be made, each capable of lasting a hundred years on the landscape. Haven't we *all* reason to be glad for changes in attitude, and for a chance to do things in a better way? We all ought to take space exploration more seriously, and set about at once to tidy our own little spherical spaceship, and conserve our consumables, and meet each emergency with ingenuity and with determination to bring the ship in.

Mr. Chairman and distinguished members, we thank you for your kind words, for your greatly appreciated awards, and your generous invitation to share these days with you. In addition, I should like to thank all of you for listening so patiently to my remarks.

Sixty-Five Outstanding Teachers

MCA's College Chemistry Teacher Awards Recipients

1970

MR. ROBERT L. BURHAM
Grand View College
Des Moines, Iowa
(Special Two-Year College Award)

DR. ROBERT E. TREYBAL
New York University
New York, New York

DR. HOWARD ANTHONY NEIDIG
Lebanon Valley College
Annville, Pennsylvania

DR. EUGENE GEORGE ROCHOW
Harvard University
Cambridge, Massachusetts

1969

DR. CORWIN H. HANSCH
Pomona College
Claremont, California

DR. ANNA JANE HARRISON
Mount Holyoke College
South Hadley, Massachusetts

MR. JOSEPH B. NORDMANN
Los Angeles Valley College
Van Nuys, California
(Special Two-Year College Award)

1968

DR. JOHN CHRISTIAN BAILAR, JR.
University of Illinois
Urbana, Illinois 61801

DR. CLARK EUGENE BRICKER
The University of Kansas
Lawrence, Kansas 66044

DR. LEO SCHUBERT
The American University
Washington, D. C. 20016

1967

DR. CARL TABB BAHNER
Carson-Newman College
Jefferson City, Tennessee 37760

DR. OTTO THEODOR BENFZY
Earlham College
Richmond, Indiana 47374

DR. R. THOMAS SANDERSON
Arizona State University
Tempe, Arizona 85281

DR. WILLIAM T. MOONEY, JR.
El Camino College
Van Torrance, California 90506
(Special Two-Year College Award)

1966

DR. W. THOMAS LIPPINCOTT
The Ohio State University
Columbus, Ohio 43210

DR. LEONARD K. NASH
Harvard University
Cambridge, Massachusetts 02138

DR. RICHARD W. RAMETTE
Carleton College
Northfield, Minnesota 55057

1965

DR. ERNEST L. ELIEL
University of Notre Dame
Notre Dame, Indiana

DR. ALBIN IVER JOHNSON
McMaster University
Hamilton, Ontario, Canada

DR. WILLIAM F. KIEFFER
College of Wooster
Wooster, Ohio

1964

DR. HUBERT N. ALYEA
Princeton University
Princeton, New Jersey

DR. SARA JANE RHODES
University of Wyoming
Laramie, Wyoming

DR. JOHN H. WOLFENDEN
Dartmouth College
Hanover, New Hampshire

1963

DR. ERNEST BERLINER
Bryn Mawr College
Bryn Mawr, Pennsylvania

DR. FRANK HOVORKA
Western Reserve University
Cleveland, Ohio

DR. ERNEST HAYWOOD SWIFT
California Institute of Technology
Pasadena, California

DR. JOSEPH D. DANFORTH
Grinnell College
Grinnell, Iowa

DR. LAURENCE E. STRONG
Earlham College
Richmond, Indiana

DR. EDWIN ODDE WHO
University of Rochester
Rochester, New York

1962

DR. JOHN FRANKLIN BAXTER, JR. University of Florida Gainesville, Florida	DR. CARL M. HILL Tennessee Agricultural and Industrial State University Nashville, Tennessee	DR. REUBIN B. SANDIN University of Alberta Edmonton, Alberta, Canada
DR. JAMES A. CAMPBELL Harvey Mudd College Claremont, California	DR. HAROLD A. IDDLIS University of New Hampshire Durham, New Hampshire	DR. GERRIT VAN ZYL Hope College Holland, Michigan

1961

DR. RICHARD M. BADGER California Institute of Technology Pasadena, California	DR. SAMUEL P. MASSIE, JR. Fisk University Nashville, Tennessee	DR. JOHN R. SAMPEY, JR. Furman University Greenville, S. C.
DR. ELLIS L. KRAUSE Marietta College Marietta, Ohio	DR. LOUIS A. PAPPENHAGEN Mount Union College Alliance, Ohio	DR. R. NELSON SMITH Pomona College Claremont, California

1960

DR. JOHN DE VRIES Calvin College Grand Rapids, Michigan	DR. BEN HARRISON PETERSON Coe College Cedar Rapids, Iowa	DR. WALTER HUGO STOCKMAYER Massachusetts Institute of Technology Cambridge, Massachusetts
DR. REYNOLDS C. FUSON University of Illinois Urbana, Illinois	DR. FRANCIS O. RICE Georgetown University Washington, D. C.	DR. MONDIE D. TAYLOR Howard University Washington, D. C.

1959

DR. JAMES B. CULBERTSON Cornell College Mount Vernon, Iowa	DR. ROY ISRAEL GRADY The College of Wooster Wooster, Ohio	DR. LOUISE KELLEY Goucher College Baltimore, Maryland
DR. LOUIS FREDERICK FIESER Harvard University Cambridge, Massachusetts	DR. HANS B. JONASSEN Tulane University New Orleans, Louisiana	DR. RICHARD EDWARD POWELL University of California Berkeley, California

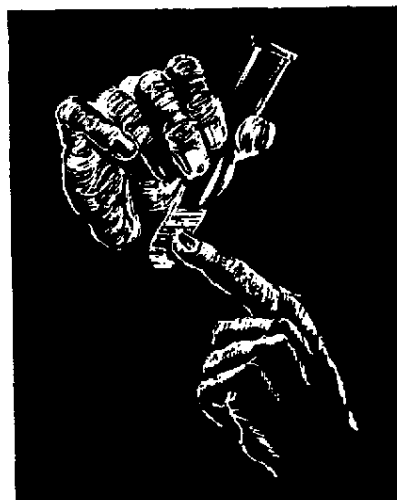
1958

DR. PAUL W. BOUTWELL Beloit College Beloit, Wisconsin	DR. CARL WALDO HOLL Manchester College N. Manchester, Indiana	DR. JESSE LEROY RIEBSOMER University of New Mexico Albuquerque, New Mexico
DR. ELIZABETH DYER University of Delaware Newark, Delaware	DR. SHERWIN MAESER Utah State University Logan, Utah	DR. ARTHUR EUGENE WOOD Mississippi College Clinton, Mississippi

1957

DR. EMIL O. ELLINGSON St. Olaf College Northfield, Minn.	DR. ARTHUR F. SCOTT Reed College Portland, Oregon	DR. JOHN TURKEVICH Princeton University Princeton, N. J.
DR. ASHLEY ROBEY Roanoke College Salem, Virginia	DR. GARRETT W. THIESSEN Monmouth College Monmouth, Illinois	DR. LEO K. YANOWSKI Fordham University New York, New York

NOTE: Institutions of recipients are those where they were teaching when awards were made.



Manufacturing Chemists Association

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WILLIAM J. DRIVER

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Company

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Minnesota Mining and
Manufacturing Company

ROBERT C. BUSCH
Diamond Shamrock Corporation

S. T. CLARK
Celanese Corporation

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Union Carbide Corporation

F. L. CUTHBERT
National Lead Company

ALLEN R. DESCHERE
Rohm and Haas Company

J. F. C. DIXON
Canadian Industries Limited

GORDON L. FOOTE
The Procter & Gamble Company

WALTER S. GUTHMANN
Ventron Corporation

JOHN H. HOWARD
Eastman Kodak Company

CECIL E. JOHNSON
Montanto Company

EVERETT N. LUCE
The Dow Chemical Company

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FRANK A. J. MOSS
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LANE F. MCBURNEY
Hercules Incorporated

GERALD E. OTTOSON
Allied Chemical Corporation

JOSEPH P. PALUMBO
Chemetron Corporation

CHARLES E. PARKER, JR.
Shell Companies Foundation
Incorporated

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& Company

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American Cyanamid Company

ROBERT W. SCHIESSLER
Mobil Oil Corporation

ROBERT J. WOLF
B. F. Goodrich Chemical
Company

HARRISON H. YOUNG, JR.
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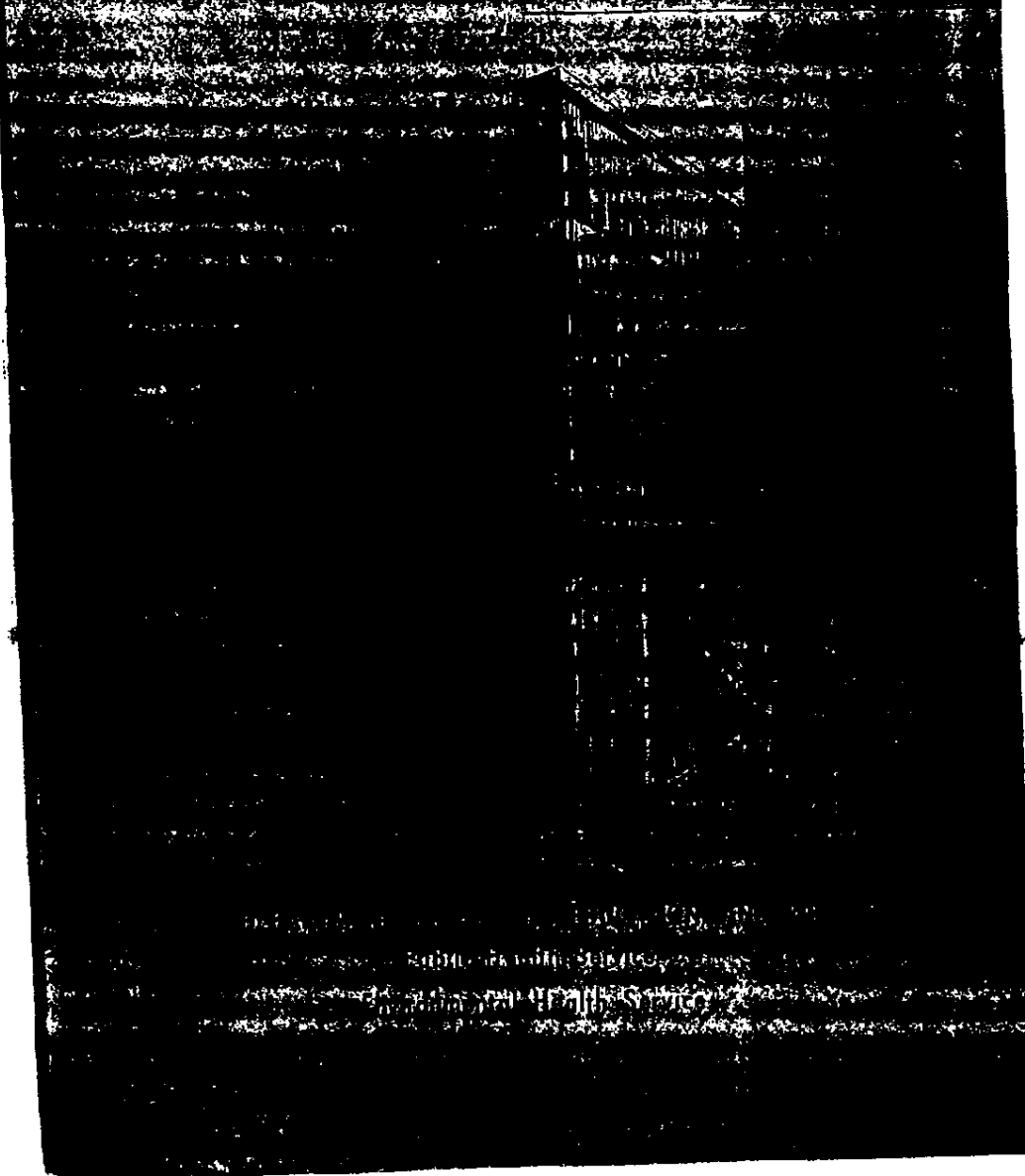
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ATMOSPHERIC EMISSIONS

FROM WET PROCESS

PHOSPHORIC ACID MANUFACTURE



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**ATMOSPHERIC EMISSIONS
FROM
WET-PROCESS PHOSPHORIC
ACID MANUFACTURE**

Cooperative Study Project
Manufacturing Chemists' Association, Inc.
and
Public Health Service

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Environmental Health Service
National Air Pollution Control Administration
Raleigh, North Carolina
April 1970

AP00037198

PREFACE

To provide reliable information on the nature and quantity of emissions to the atmosphere from chemical manufacturing, the Public Health Service, United States Department of Health, Education, and Welfare, and the Manufacturing Chemists' Association, Inc., entered into an agreement on October 29, 1962, to study emissions from selected chemical manufacturing processes and to publish information that would be helpful to air pollution control and planning agencies and to chemical industry management.* Direction of these studies is vested in an MCA-PHS Steering Committee, presently constituted as follows:

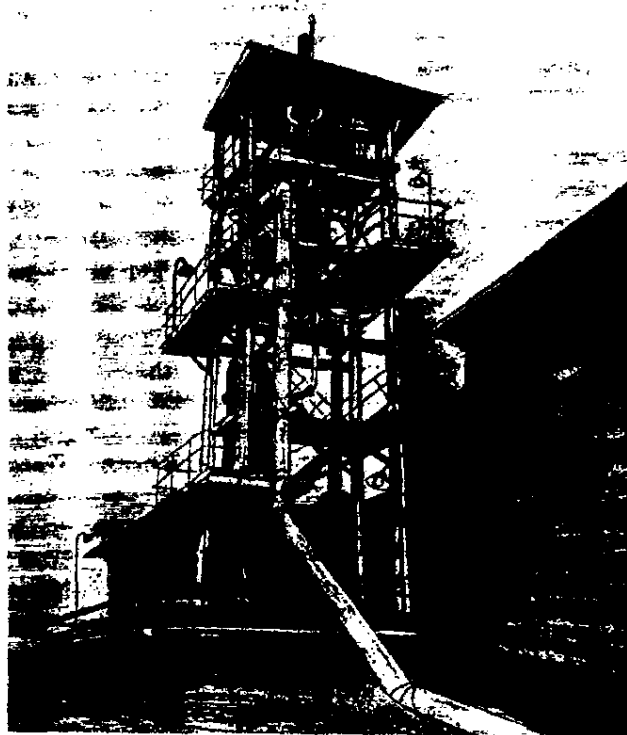
Representing PHS	Representing MCA
Stanley T. Cuff†	Willard F. Bixby†
Robert L. Harris, Jr.	Louis W. Roznoy
Dario R. Monti	Clifton R. Walbridge
Raymond Smith	Elmer P. Wheeler

Information included in these reports describes the range of emissions during normal operating conditions and the performance of established methods and devices employed to limit and control such emissions. Interpretation of emission values in terms of ground-level concentrations and assessment of potential effects produced by the emissions are both outside the scope of this program.

*Reports in this series to date are Atmospheric Emissions from Sulfuric Acid Manufacturing Process, Public Health Service Publication No. 999-AP-13, Atmospheric Emissions from Nitric Acid Manufacturing Processes, Public Health Service Publication No. 999-AP-27, and Atmospheric Emissions from Thermal-Process Phosphoric Acid Manufacture, Public Health Service Publication No. 999-AP-48, and Atmospheric Emissions from Hydrochloric Acid Manufacturing Processes, National Air Pollution Control Administration Publication No. AP-54.

†Principal representative.

ATMOSPHERIC EMISSIONS FROM HYDROCHLORIC ACID MANUFACTURING PROCESSES



**U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Consumer Protection and Environmental Health Service**

AP00037200

**ATMOSPHERIC EMISSIONS
FROM HYDROCHLORIC ACID
MANUFACTURING PROCESSES**

**Cooperative Study Project
Manufacturing Chemists' Association, Inc.
and
Public Health Service**

**U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Consumer Protection and Environmental Health Service
National Air Pollution Control Administration
Durham, North Carolina
September 1969**

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 35 cents

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FIGURES

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Carolina 27805.

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PREFACE

To provide reliable information on the nature and quantity of emissions to the atmosphere from chemical manufacturing, the Public Health Service, United States Department of Health, Education, and Welfare, and the Manufacturing Chemists' Association, Inc., entered into an agreement October 29, 1962, to study emissions from selected chemical manufacturing processes and to publish information that would be helpful to air pollution control and planning agencies and to chemical industry management.* Direction of these studies is vested in an MCA-PHS Steering Committee, presently constituted as follows:

Representing PHS
Stanley T. Cuffe†
Robert L. Harris, Jr.
Dario R. Monti
Raymond Smith

Representing MCA
Willard F. Bixby†
Louis W. Roznoy
Clifton R. Walbridge
Elmer P. Wheeler

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†Principal representatives.

Silver Anniversary

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PLASTICS GROUP

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Association

September 8-11, 1970

SEAVIEW COUNTRY CLUB
ABSECON, NEW JERSEY

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General Bulletin

MCA

MANUFACTURING
CHEMISTS
ASSOCIATION

1825 CONNECTICUT AVENUE, N. W.

WASHINGTON, D. C. 20009

(202) 483-6126

THE 20th SEMIANNUAL MEETING...

NUMBER 994

...attracted nearly 1000 registrants representing 143 member companies. Held on November 24th at the New York Hilton, the one-day event--which featured four panel sessions, two receptions, a luncheon and a banquet--began with registration at 8:00 a.m. and ended some 13 hours later.

DECEMBER 22, 1970

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A milestone was the first appearance of a woman as the luncheon speaker. She is The Honorable Virginia H. Knauer, President Nixon's Special Assistant for Consumer Affairs. A "belle" at the pre-luncheon reception, she chatted animatedly with everyone, including MCA President William J. Driver and MCA Board Chairman, Clifford D. Siverd, who is also President and Chief Executive Officer of American Cyanamid Company.



Linda McNabb (left), secretary to MCA's Assistant Secretary-Treasurer, Bruce Barackman, headed up the busy registration desk staff.

The major Semiannual Meeting address--at the banquet--was delivered by Senator Birch Bayh (D.-Ind.), Chairman of the Constitutional Amendments Subcommittee of the Senate Judiciary Committee. Earlier, the Senator held a news conference which was covered by more than a dozen reporters for the public and trade press and by CBS Network Television.



DRIVER KNAUER SIVERD



SENATOR BAYH

AP00037207

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Page 6	New Look In Educational Activities Barge Safety Courses To Begin
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Participants in Panel I, "Economic Outlook for The Chemical Industry," included (left to right): The Honorable Murray L. Weidenbaum, Assistant Secretary for Economic Policy, U. S. Treasury Department; Dr. Earl T. McBee (Moderator), Chairman of the Board, Chief Executive Officer and President, Great Lakes Chemical Corporation; Nathaniel Goldfinger, Director, Department of Research, AFL-CIO; George Champion, retired Chairman of the Board, Chase Manhattan Bank, N.A.; and Carl A. Gerstacker (inset), Chairman of the Board, The Dow Chemical Company.



Panel II, "The Chemical Industry's Role in A Clean Environment," offered papers by (left to right): Herbert D. Doan, President, The Dow Chemical Company; Carroll F. Wilson, Professor of Management, Massachusetts Institute of Technology; Clifton C. Garvin (Moderator), Executive Vice President, Standard Oil Company (New Jersey); and Dr. John T. Middleton, Commissioner, National Air Pollution Control Administration.



"Productivity -- Denominator of Growth" was the topic of panel III. Participants (left to right) included: Harry B. Warner (Moderator), President, The B. F. Goodrich Company; Dr. John W. Kendrick, Professor of Economics, George Washington University; David C. Williams, MCA Government Relations staff member, who read a paper by The Honorable Geoffrey H. Moore, Commissioner, Bureau of Labor Statistics, U. S. Department of Labor (Mr. Moore arrived at the meeting but was called away on urgent business before being able to speak); and Dr. Charles B. Reeder, Chief Economist, E. I. du Pont de Nemours & Company.

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