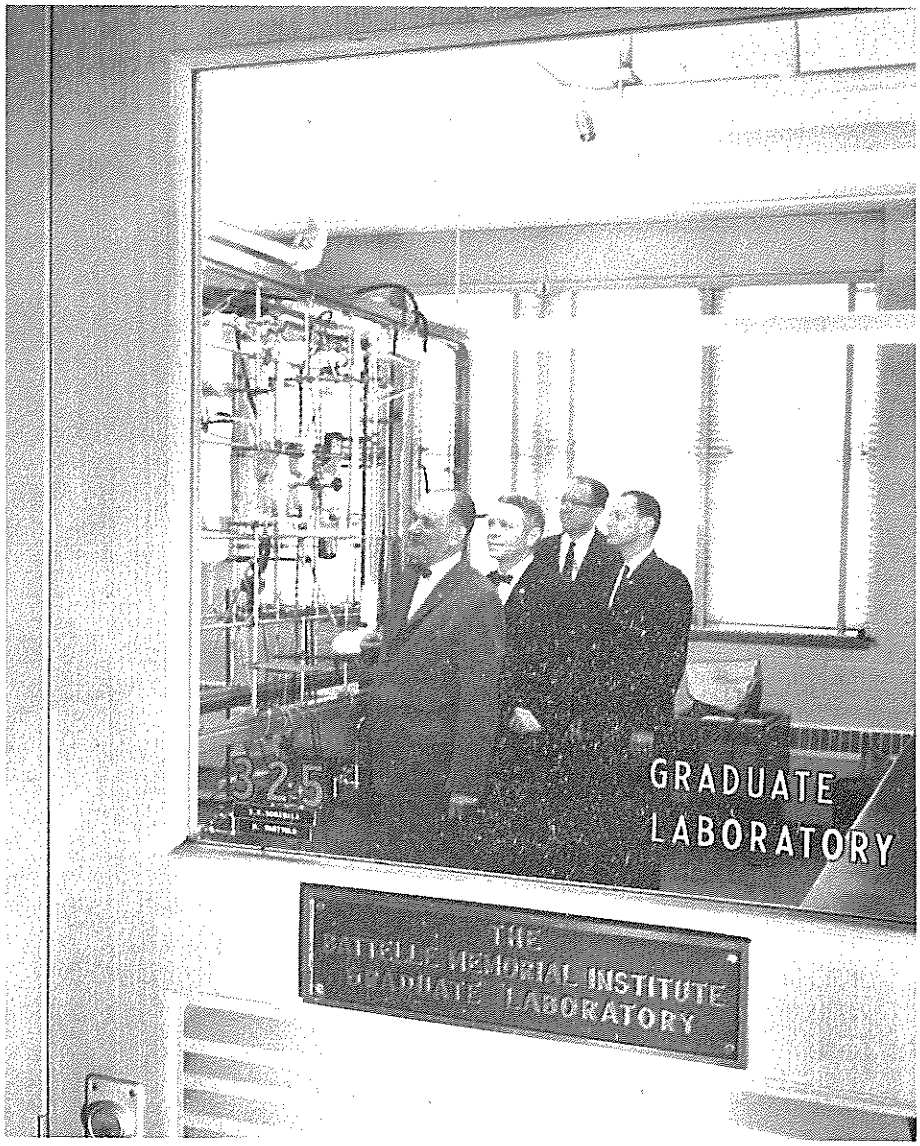
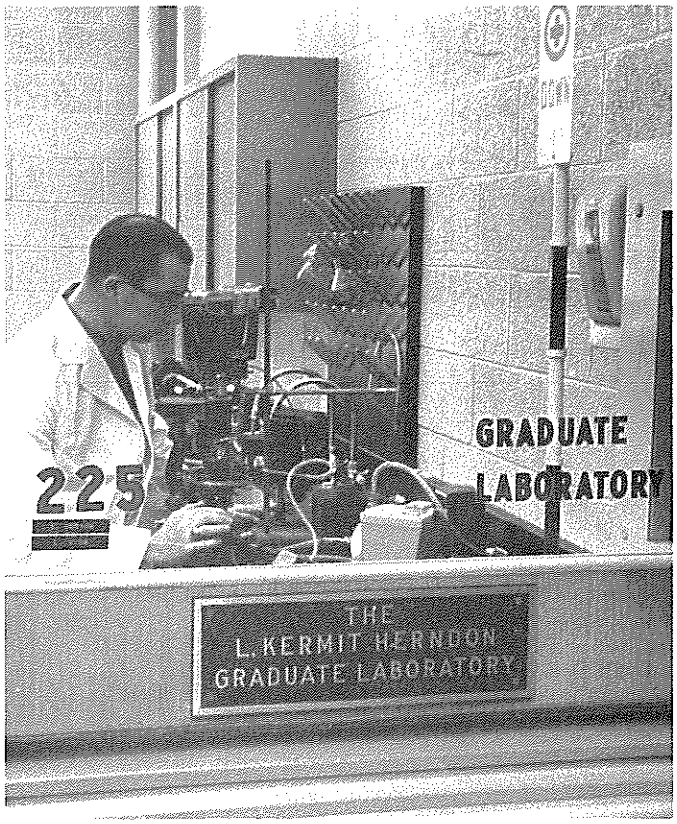
March 14, 1962

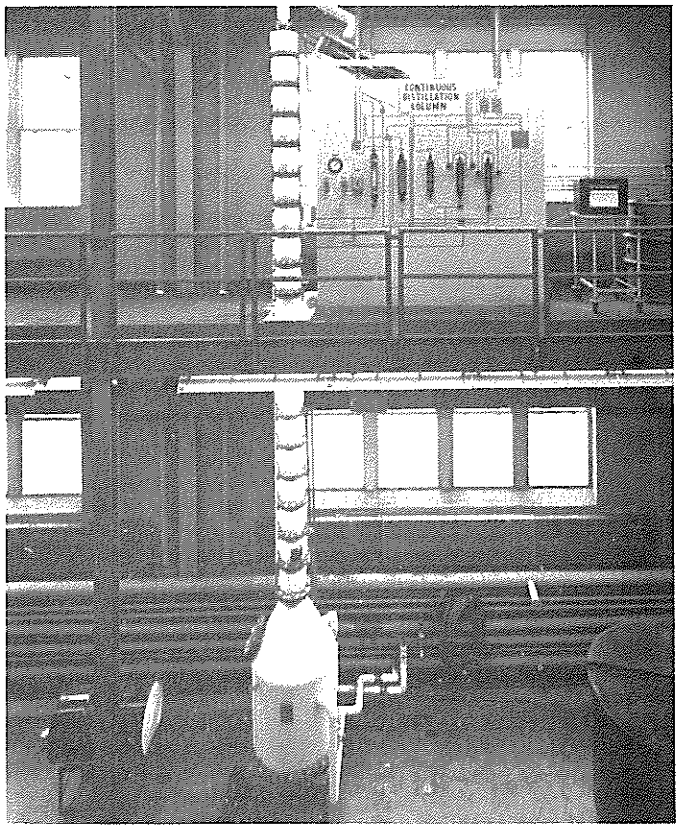
Fourteenth Annual Report to the Chemical Engineering Alumni The Ohio State University





THE L. KERMIT HERNDON GRADUATE LABORATORY

THE FURNISHINGS IN THIS LABORATORY WERE MADE POSSIBLE BY THE VERY GENEROUS CONTRIBUTION OF DR. L. KERMIT HERNDON, B.CH.E. '29; M.SC. '31; PH.D. '38.



THIRTY FIVE PLATE CONTINUOUS DISTILLATION UNIT DONATED TO THE DEPARTMENT BY THE CHEMICAL AND PLASTICS DIVISION, FOOD MACHINERY AND CHEMICAL CORPORATION, FAIRFIELD PLANT, BALTIMORE, MARYLAND. THIS CONTRIBUTION WAS MADE POSSIBLE THROUGH THE KINDNESS OF DR. CARL PRUTTON WHO WAS VICE-PRESIDENT OF THE CORPORATION, AND DANA DEAN DAVIS, CHIEF ENGINEER, FAIRFIELD PLANT, B.CH.E. '39.

TABLE OF CONTENTS
FOURTEENTH ANNUAL REPORT

March 14, 1962

FOURTEENTH ANNUAL REPORT TO THE ALUMNI OF
THE CHEMICAL ENGINEERING DEPARTMENT AND THE PETROLEUM ENGINEERING DIVISION
OF THE OHIO STATE UNIVERSITY

Dear Jewels:

To report to all of you, once again, on the State of our Department, is so heart warming that the coldness of the Winter was just a bad dream to me. For me it is the best time of the year as each of you are brought into focus when I check the names and addresses on the some 2000 envelopes we send out. Our file of alumni is still the best of any department in the country, but not perfect. Last year we had about 20 envelopes returned with the cold notation "MOVED - NO FORWARDING ADDRESS". Our "alumni-bloodhounds" informed us of the addresses of about 12, but the remaining 8 are now in our "Lost, Strayed, and Stolen File" (see page 3c).

We are looking forward to as many as possible coming back

FRIDAY, MAY 4

TO ATTEND THE

NINTH ANNUAL CONFERENCE FOR ENGINEERS AND ARCHITECTS

The general program and that of the Chemical Engineering Department is given on page 3. Each of you should receive the brochure prepared by the College of Engineering, together with a reservation and personal data card. Kindly send the latter in if you cannot be with us Friday, May 4. This will help to keep our records up-to-date.

BRING A HIGH SCHOOL STUDENT WITH YOU

Given below is a copy of Dean Bolz's invitation to all of you to bring a high school student with you. It is being repeated in this report to emphasize the importance of this (see page 13 - Enrollment in the College of Engineering), and also to make sure that all of the Chemical Engineering alumni know of this invitation. If you are not on the College of Engineering's mailing list, which might be true of some who did their undergraduate work at another university, kindly let me know.

The registration fee for the high school student which includes the luncheon is $2.50. PRE-REGISTRATION IS ESSENTIAL TO GUARANTEE LUNCHEON RESERVATION. You can write me giving the student's name, high school, address, and branch of Engineering or Architecture of special interest, and also the $2.50 registration fee. We will preregister the student. The registration fee for the alumni, which includes the luncheon, is $5.00.

"You are invited to BRING A STUDENT WITH YOU. We have added a new feature to our Annual Conference this year - one which should be of concern to you alumni who are interested in bringing "new blood" into the profession. This will be a special session for high school students who are interested in engineering and architecture.

This Ninth Annual Conference for Engineers and Architects is especially planned to bring together our busy alumni and friends to hear

top-flight engineering leaders pinpoint today's problems and tomorrow's challanges. It will also give you a chance to inspect the many exciting research programs which are under way in our College of Engineering.

While the program is still primarily for our alumni and friends, surely prospective students of engineering and architecture will gain inspiration from hearing our key speakers and seeing the presentation of awards to honor students and distinguished alumni of the College.

If you would like to bring an interested student with you and help introduce him to the profession, you may register him for the conference and luncheon at the special student rate of $2.50. A college student will be his host and guide for the day.

I hope that I may have the privilege of greeting you at the conference. Please be assured that your interest in the progress of our College is most appreciated.

Sincerely yours,
HAROLD A. BOLZ
Dean"

THE FRONT COVER

CHRISTENING A LABORATORY

As was brought out in last year's report, Battelle Memorial Institute very generously contributed $9,000.00 to the Ohio State University Development Fund Project 5659, Department of Chemical Engineering Research Equipment Fund. This amount was equivalent to the cost of the complete furnishings in one of the graduate laboratories. As will be noted, this laboratory will now be known as The Battelle Memorial Institute Graduate Laboratory. This laboratory is already being used by graduate students conducting research on kinetics of adsorption. From left to right are: Joseph H. Koffolt; Dr. John W. Clegg, Manager of Battelle's Department of Chemical Engineering; Dean Harold a Bolz, Dean of the College of Engineering; and Edward E. Slowter, Battelle Vice President.

The contribution will be used for the purchase of research equipment for the Department, since the laboratory furnishings have already been paid out of the $2,400,000 which was allocated by the State for the Building. It is hoped that other chemical companies will also aid our Department in equipping the Building with adequate research equipment.

On the backside of the front page is shown another Graduate Laboratory in honor of Dr. L. Kermit Herndon for also making a very generous contribution to our Alumni Drive.

THE ANNIVERSARY CLASS

This year we salute the following Anniversary Classes: 1912, 1917, 1922, 1927, 1937, 1942, 1947, 1952, and 1957. We are looking forward to alumni from these classes to be with us on May 4.

PROGRAM 9TH ANNUAL CONFERENCE FOR ENGINEERS AND ARCHITECTS - 1962

GENERAL PROGRAM

Friday, May 4, 1962

9:00 Registration - Mershon Auditorium, 15th Avenue and North High Street

10:00 General Session - Mershon Auditorium

Presiding Harold A. Bolz, Dean of College of Engineering

Welcome - Gordon B. Carson, Vice President of Business and Finance, The Ohio State University

Presentation of Texnikoi Alumni Award

Comments: Address - J. L. Atwood, President of North American Aviation, Inc. Topic: The Challenges We Face

11:30 Luncheon Session - Ohio Union Ballroom

Presiding Marion L. Smith, Associate Dean of College of Engineering

Address - Major General Augustus M. Minton, Director of Civil Engineering, U.S. Air Force, Pentagon Building, Washington, D.C.

Topic: The Challenge of the Engineer in the Space Age

DEPARTMENTAL PROGRAM

DEPARTMENT OF CHEMICAL ENGINEERING

CHEMICAL ENGINEERING BUILDING, ROOM 207, 140 WEST 19th AVENUE

2:00 Departmental Program - Presiding: Joseph H. Koffolt, Department Chairman

Welcome to Alumni and Anniversary Classes of 1912, 1917, 1922, 1927, 1937, 1942, 1947, 1952 and 1957.

Presentation of Student Awards in Chemical Engineering

American Institute of Chemical Engineers - Annual Scholarship Award

Central Ohio Section, American Institute of Chemical Engineers - Student Contest Problem Award

American Institute of Chemists Professional Award

Introducing the Golden Anniversary Class of 1912:

Harry Weaver Brinker	Carl Hansen Huffman
Henry Leroy Coles	William Nelson Lorentz
Hayes Tryford Darby	George Alexander Nesbitt

Walter Henry Weinberg

2:00 Inspection of Research Work and Facilities of the Department. Guides will be members of the Ohio State Student Chapter-American Institute of Chemical Engineers. Those who wish to socialize can do so in the Unit Operations Laboratory where refreshments will be available up to 5:00 p.m.

Phase Behavior of Mixtures in the Critical Region - Dr. Kay Room 436

Adsorption Dynamic Studies of Gases on Solids; Solution of Rate Equations for Multiphase Reaction Systems with the Aid of Computers - Dr. Syverson, Room 314

Mass Transfer of Gases and Liquids - Dr. Geankoplis, Room 336

Nuclear Engineering, Heat Transfer, and Process Development - Dr. Dryden, Room 221B

Fluid Flow and Fluid Displacement, Phase Relations in Petroleum Reservoirs - Professor Slider - Room 414

Problems of Fluid Dynamics in Chemical Engineering - Mixing, Turbulence, etc. - Dr. Brodkey, Room 306

Chemical Kinetics of Flow Reactors - Dr. Corrigan, Room 310

4:00 Socializing for all and refreshments in the Unit Operations Laboratory - Room 117

THE OHIO STATE UNIVERSITY DEVELOPMENT FUND PROJECT 5659, DEPARTMENT CHEMICAL ENGINEERING RESEARCH EQUIPMENT FUND

The plaque giving the names of the some 756 Chemical and Petroleum Engineers who have contributed is now in the process of being made. Hiss Stamp Company has been given the order. The cost will be about $1,125.00. We are expecting it to be completed and installed in the hallway of the Building by ACE Day, May 4.

The following is a summary of the contributions to date:

Total Number Contributing.	756
Total Amount Pledged.	$66,305.12
Matching Contributions By Companies	2,699.87
Total Amount Pledged and Matched.	$69,004.99
Total Amount Paid on Pledges.	61,422.77
Amount Still To Be Paid on Pledges*	$ 7,582.22

*We have not sent out reminders to some of the contributors of their unpaid pledges. Some of these are paying their pledges in installments from 2 to 5 years. If you are not sure whether your pledge has been paid up, the amount of your balance, or the amount of your original pledge, we will be happy to inform you if you will write to us.

If you wish to make a payment on your pledge or wish to make a contribution, make out your check to:

THE OHIO STATE UNIVERSITY DEVELOPMENT FUND (PROJECT 5659)

and address it to: Joseph H. Koffolt, 140 West 19th Avenue, The Ohio State University, Columbus 10, Ohio. After entering in our books, we will send it to the Development Fund office.

FELLOWSHIPS, SCHOLARSHIPS, GRANT-IN-AIDS AND OTHER CONTRIBUTIONS TO THE CHEMICAL ENGINEERING DEPARTMENT

The generosity of the companies and agencies listed below is once again acknowledged and is sincerely appreciated. The companies are making an outstanding contribution to Chemical Engineering education at The Ohio State University. It would be impossible to have a Graduate Program without this help. All of the fellowships include a contribution to the Department for the purchase of research equipment and other items needed by the Department.

The undergraduate scholarships have been quite a help to worthy students. These scholarships have made it possible for them to devote full time to their studies without the pressure of doing outside work.

The grant-in-aids were very helpful in many respects. For example, financial aid to graduate students who were just finishing up and did not have any financial support; travel for Faculty members to attend National Meetings for the purpose of presenting papers, keeping up with the technological explosion in chemical engineering, to participate in committee meet-

ings, and presiding at meetings in which they are officers. Even though we have a travel budget, it is limited to in-state travel and University business out of the state. This budget cannot be used to attend other meetings.

The grant-in-aids have also been used for the purchase of accessories for equipment being set up in our laboratories. Even though our budget for this is substantial, additional funds are necessary. The grant-in-aids have been a great assistance.

The following are the names of the companies who have donated scholarships and fellowships to the Department. In some of these cases, the fellowships will be effective this coming year. The many companies giving grant-in-aids are also included.

FELLOWSHIPS

1. Dow Chemical Company
2. Eastman Kodak Company
3. E. I. du Pont de Nemours and Co. Teaching Fellowship
4. Esso Research and Engineering Co.
5. General Electric Education and Charitable Fund
6. Koppers Company Teaching Fellowship
7. Lubrizol Corporation
8. Linde Air Products, Div. of U.C.C.
9. Procter and Gamble Company
10. Shell Companies Foundation
11. Ohio State University
12. National Science Foundation

UNDERGRADUATE SCHOLARSHIPS

1. Chemstrand Corporation
2. Dow Chemical Company
3. Goodyear Foundation
4. Koppers Company, Inc.
5. Monsanto Chemical Company
6. Society of Plastics Engineers
7. Union Bag-Camp Corporation
8. Union Carbide Chemicals Co., Div. of U.C.C.
9. Universal Oil Products

GRANT-IN-AIDS

1. Dow Chemical Company
2. Dow Corning Corporation
3. Hercules Powder Company
4. Linde Air Products, Div. of U.C.C.
5. Mead Corporation
6. Monsanto Chemical Co.
7. National Carbon Co.,Div. of U.C.C.
8. Pittsburgh Plate Glass Co. - Chemical Division
9. Union Carbide Chemicals Corp., Div. of U.C.C.
10. Universal Oil Products

(In some cases, these rotate with other departments at Ohio State and other universities.)

THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

Once again the transfers from Student Membership to Associate at Ohio State University is 100%. We have kept this record for the past ten years. Last summer I made a list of alumni in the Department who were members of A.I.Ch.E. The predominant group belonging to the Institute have been from those graduating since 1948. The number decreases as we go into the graduates of the 30's, 20's, and before 1920. Membership in the Institute is a mark of professionalism. I do know when I graduated in 1924 membership was not mentioned or encouraged. I joined in 1935 - this membership has been rewarding.

Under part B of this report is the speech given by John J. Healy,Jr. at the Presidential luncheon of the American Institute of Chemical Engineers

(CONTINUED ON PAGE 7)

DEPARTMENT OF CHEMICAL ENGINEERING

LIST OF STAFF MEMBERS, FELLOWS, SCHOLARS, AND RESEARCH FOUNDATION STAFF-1961-62

I. PROFESSORS
1. Joseph H. Koffolt (Chairman)
2. Webster B. Kay
3. Aldrich Syverson
4. Edward V. O'Rourke (Emeritus)
5. Christie J. Geankoplis
6. Peter O. Krumin
7. Charles E. Dryden

II. ASSOCIATE PROFESSOR
1. Hertzel Slider
2. Waldron D. Sheets
3. Edwin E. Smith
4. Thomas C. Gorrigan
5. Robert S. Brodkey

III. ASSISTANT PROFESSORS

IV. INSTRUCTORS
1. Edwin R. Haering

V. INSTRUCTOR AND DU PONT POSTGRADUATE TEACHING FELLOW
1. Gerald Wilcox

VI. GRADUATE ASSISTANTS
1. Robert Kasper
2. John H. Miller
3. J. David Porthouse
4. Kent L. Shepherd
5. Keith Bazaire

VII. LECTURERS
1. Frank Nuhfer
2. Alex Lemmon
3. Edward L. Kropa

VIII. STUDENT ASSISTANT
1. Ronald Kelley

IX. SECRETARY
1. Marjean Trau

X. STENOGRAPHERS
1. Patricia Shemenski
2. Sylvia Wicker

XI. MECHANIC
1. Keldon Latham

XII. TECHNICIAN
1. Herman Breining

XIII. FELLOWSHIPS
1. Dow Chemical - B. Harshbarger
2. Dow Chemical - J. P. Henry, Jr.
3. Esso Res. and Eng.-J.Williamson
4. G.E. Education and Charitable Fund - In Mech. Eng. 1961-62.
5. Lubrizol Corp. - D. Bidstrup
6. National Science Foundation -
   Sanford Bloom
   Allan Jones
   Larry Wing
7. Procter and Gamble - F. Groening
8. Linde - J. Genco
9. Shell Oil - R. Kovach
10. Iraq Government - J. N. Al-Sheikh
11. International Co-op Admin. Chile Fellow - R. Donoso
12. University Fellow - D. Hazlebeck
13. Koppers Teaching Fellow - E. Stahel

XIV. SCHOLARSHIPS
1. Chemstrand - E. T. Woodruff
2. Dow Chemical - J. Kosmider, Jr.
3. Charles McDonald Scholar - Myers G. Hammond
4. Monsanto Chemical - P. Pflaumer
5. Union Carbide Chemicals - Richard Hoffman
6. Universal Oil Products -
   John Birle
   Martin Cohen
7. Union Bag-Camp Corp. - W. D. Staten
8. Society of Plastic Engr. - W. Howard Sidner
9. Koppers Co. - Stanley Metelko
10. *Goodyear Foundation - Dean Snider

XV. RESEARCH ASSISTANTS - RESEARCH FOUNDATION
1. Edward R. Corino
2. Dae Sik Kim
3. William H. Kirby
4. Jon Lee
5. James Leslie
6. Heung T. Kim
7. Kenneth Burke
8. Bruce Strickland

XVI. ENG. EXP. STATION ASSISTANT

XVII. ARGONNE RESEARCH ASSISTANT
1. Lawrence Steele
2. Dean Traylor
3. Donald Wilhelm

*Through an oversight on my part, the name of Jerome Kosmider who was the Goodyear Scholar was omitted from last year's report. I am sorry.

in New York last December. His speech was entitled "The Future of Chemical Engineering". It was one of the finest I ever heard and it is for this reason that I am including it in this report. I urge everyone to read it.

I will be happy to send you an application blank for membership in the Institute.

On the last page of this report I have also given the famous report of the State Engineer of New York entitled "Canals Are Facts; Railroads Are Theories".

I thought that this would be apropos at this time where there is danger of bureaucratic control of research.

SALARY OFFERS AND PLACEMENT OF CHEMICAL ENGINEERS

The placement of last year's graduates in Chemical Engineering and this year's salary offers are given on pages 8 through 11. It will be noted that once again salaries are up. The demand for chemical engineers this year has been fantastic. All of the March, June, and August, 1962 graduates had so many invitations and salary offers that they quit taking interviews at the end of the Autumn Quarter. If we had four times the number of graduates there still would have been many jobs for all of them.

ENROLLMENT

Engineering enrollment is becoming a serious matter in all schools in the United States. The data for the Autumn Quarter is given on page 13. During 1962 we will graduate 21 Bachelors, in 1963 there will be about 22, and in 1964 about 30.

Along these lines, the following article in a recent issue of the Columbus Dispatch by William Fulwider who had interviewed Dean Harold A. Bolz of our College of Engineering. The article was entitled "Interest Declines in Engineering". The following are excerpts from it.

"One hundred years were necessary for the United States to build up its affluency, but other countries, using us as an example, can do the same thing in 25 years, believes Harold A. Bolz, dean of the Ohio State University's Engineering School.

This means competition and "unless we have more and smarter engineers, they're going to outstrip us," Bolz warned.

"We may have enough engineers for one or a few programs, but we don't have enough for all the programs vital to winning the war of competition."

Bolz cited figures. The Russians are turning out 125,000 engineers a year. The National Science Foundation of the government estimates U.S. needs at 81,000 a year, needs which are not being met.

The U.S. produced 52,700 engineers in 1950, 37,800 in 1960 and estimates for 1965 are only 32,000.

(CONTINUED ON PAGE 12)

PLACEMENT OF CHEMICAL ENGINEERING GRADUATES
JUNE, 1961 - MARCH, 1962

BACHELOR OF CHEMICAL ENGINEERING

NO.	NAME	COMPANY AND LOCALITY
		JUNE, 1961
1.	Paul Richard Bigley	Ohio Fuel Gas Company, Columbus, Ohio
2.	Lynn G. Borchert	Dow Chemical Company, Midland, Michigan
3.	Paul G. Bork	Dow Corning Corporation, Midland, Michigan
4.	Thomas Edgar Cattarin	Shell Chemical Company, New York, New York
5.	David A. Fichtner	Working for M.Sc., O.S.U., Columbus, Ohio
6.	Clyde William Folk	Union Carbide Chemicals Co.,S. Charleston, W.Va.
7.	Ronald L. Follmer	Capital City Products, Columbus, Ohio
8.	Chester Gary Haines	Packar d Electric, Warren, Ohio
9.	Jack Arnold Hammond	West Virginia Pulp and Paper, Covington, Va.
10.	Theodore James Hanson	U.S.Air Force,Larson Air Force Base,Washington,D.C.
11.	Ronald David Harris	Procter and Gamble Co., Cincinnati, Ohio
12.	Robert Martin Keller	Working for M.Sc., O.S.U., Columbus, Ohio
13.	Donald Irvin King	Procter and Gamble, Cincinnati, Ohio
14.	Robert A. Krakowski	Working for M.Sc., OSU, Columbus, Ohio
15.	Alvaro Ivan Lopez	Returned to Bogota, Colombia
16.	Kenneth Dale McDaniel	Richfield Oil Company, Anaheim, California
17.	Kenneth Dale Negley	Union Carbide Chemicals,S.Charleston, W. Va.
18.	David Alfred Parker	Shell Chemical Co., Union City, New Jersey
19.	Jerry Bliss Pausch	Hercules Powder Co., Wilmington, Del.
20.	John Nicholas Rapach	General Tire and Rubber Co., Akron, Ohio
21.	Andrew George Spevak	Lubrizol Corporation, Wickliffe, Ohio
22.	Howard Hugh Warye	General Motors, Detroit, Michigan
23.	Lawrence E. Woodworth	General Tire and Rubber, Akron, Ohio
		AUGUST, 1961
1.	Dwight Madison Armitage	Capital City Products, Columbus, Ohio
2.	Richard Barkely Cooper	Working for M.Sc., OSU, Columbus, Ohio
3.	Dale Clifford Edwards	Working for M.Sc., OSU, Columbus, Ohio
		DECEMBER, 1961
1.	James Bowers	Standard Oil of New Jersey, Esso International New York, New York
		MARCH, 1962
1.	Jerome Kosmider, Jr.	Working towards M.Sc., OSU, Columbus, Ohio.
2.	James Opatrny	North American Coal Co., Cleveland, Ohio

PLACEMENT OF CHEMICAL ENGINEERING GRADUATES (Cont'd.)

MASTER OF SCIENCE

NO.	NAME	COMPANY AND LOCALITY
		JUNE, 1961
1.	Edward Robert Corino	Working for Ph.D., O.S.U., Columbus, Ohio
2.	Gordon Roger Howard	Dow Corning Corporation, Midland, Michigan
3.	Jesse Emmitt Rupert	Humble Oil and Refining, Kingsville, Texas
		AUGUST, 1961
1.	Rodrigo Donoso	Working for Ph.D., O.S.U., Columbus, Ohio
2.	Ronald David Harris	Procter and Gamble Co., Cincinnati, Ohio
		DECEMBER, 1961
1.	James W. Bowers	Standard Oil of New Jersey, Esso International New York, N.Y.
2.	Richard Berkey Cooper	California Research Corporation, Richmond, Calif.
3.	Dale Edwards	E.I. du Pont de Nemours, Circleville, Ohio
4.	David E. Hazlebeck	Working for Ph.D., O.S.U., Columbus, Ohio
5.	Robert A. Krakowski	Working for Ph.D.,
6.	Larry E. Wing	Working for Ph.D., O.S.U., Columbus, Ohio
		MARCH, 1962
1.	Robert Martin Keller	Union Carbide Chemicals, Oak Ridge, Tenn.
2.		
3.	James Williamson	Working for Ph.D., O.S.U., Columbus, Ohio

DOCTOR OF PHILOSOPHY

		JUNE, 1961
1.	James Harvey McMicking	Wayne State University, Detroit, Michigan
		AUGUST, 1961
		DECEMBER, 1961
1.	Phillip H. Gifford, II	American Oil Co., Texas City, Texas
2.	James Michael Skaates	California Research Co., Richmond, California
		MARCH, 1962
1.	Bruce Giles	Hooker Electrochemical Co., Niagara Falls, N.Y.
2.	Lawrence Jacowitz	North American Aviation Co., Columbus, Ohio

THE OHIO STATE UNIVERSITY
DEPARTMENT OF CHEMICAL ENGINEERING

March 7, 1962

OFFERS 1961-1962 NOT COMPLETE AS STUDENTS HAVE NOT TAKEN ALL THEIR PLANT TRIPS

Underlined salary is offer accepted.
*Indicates some industrial experience.
**Took very few interviews. Interested in a particular company. Accepted when offer was made. Or will graduate in December, 1962.
I International student. Will work in home country.
" Going on for Ph.D.

BACHELOR OF CHEMICAL ENGINEERING (5 Years)

	Invitations for Plant Visits	Salary Offers
1.		610, 550
2.		525, 620, 600, 555, 618, 575, 550, 585, 622, 622, 575, 600
3.		575, 600, 560, 550, 580, 550, 560
4.		615, 580
5.		595, 580, 574, 575
6.		550
7.		570, 565, 560
8.		575, 585, 570, 590, 555, 585, 600, 590, 592
9.		585, 600, 550, 580, 555, 580, 591, 575, 565

COMBINED BACHELOR OF CHEMICAL ENGINEERING AND MASTER OF SCIENCE

"1.		Going on for Ph.D.
2.		665, 635, 630, 680, 640, 620, 645, 650, 650, 685, 635
3.		625, 625, 536
4.		650, 647, 660, 625, 650, 585, 660, 630, 675
5.		660, 635, 660
6.		620, 615, 610, 625, 620
7.		660, 680, 650, 675, 650, 650, 650, 650, 650, 635
8.		615, 650, 650, 640, 675, 650, 650
9.		625, 645, 605, 631, 625
10.		685, 650, 676, 650, 695, 680
11.		670, 670, 675, 650, 610, 675, 645, 700, 640, 650
12.		

MASTER OF SCIENCE

"1.		Going on for Ph.D.
"2.		Going on for Ph.D.
"3.		Going on for Ph.D.
"4.		Going on for Ph.D.
I 5.		International student. Will work in home country.
6.		635, 650, 650, 635
7.		655, 655, 665, 615, 650, 625
8.		
9.		700, 650, 700, 700, 665, 665, 625 (M.B.A. also)

SALARY OFFERS 1961-1962 (Cont'd.)

Ph.D.

1.	840, 840, 825, 850, 925, 875, 958, 860, 875, 900, 900, 950, 850, 950
2.	875, 900, 875, 900, 820, 950, 900, 850, 900
3.	865, 900, 900, 865, 832, 850, 830, 825, 958, 850
4.	890, 900, 890
5.	850, 835, 825, 850, 850, 850
6.	850, 875, 850, 850, 850, 800
Δ 7.	833, 900, 850, 875, 975
Δ 8.	910
Δ 9.	
I 10.	International student. Will work in home country

Δ At Argonne National Laboratories

PETROLEUM ENGINEERING STUDENTS

BACHELOR OF PETROLEUM ENGINEERING

1.	550
2.	525
3.	525, 575

MASTER OF SCIENCE IN PETROLEUM ENGINEERING

1.	600, 680, 550

SUMMER JOBS

Graduate Students

1. 700, 700
2. 775
3. 540

Fourth-year Students

1. 490
2. 540
3. 480, 490
4. 480
5. 540, 490, 500
6. 500, 480, 530, 480, 500

Third-year Students

1. 475
2. 510
3. 460
4. 440
5. 460
6. 460, ...
7. 475
8. 480
9. 443

OSU enrollment reflects the trend. In 1957, 10.8 per cent of freshmen were in engineering. In 1960, this had dropped to 7.3 per cent and in 1961, 7 per cent, Bolz revealed.

"Engineers may be the saviors of civilization," said Bolz.

"Those who have written about our eating ourselves out of existence were people who didn't realize what science and engineers can do.

"Everybody worries about how everybody's going to live as the world population grows. Well, engineers can control environment, weather and climate, and make them livable and comfortable.

"The way it looks, there's nothing to keep us from living in space, or even underground or under water. Some such ideas may be too wild to even mention," Bolz admitted, "but grandfather would never have thought color TV was possible either."

Because of demand and lack of supply, Bolz said an average of five companies offering jobs visit the OSU campus for each graduate. This may go up 25 per cent within a year.

What's the problem then? Why is the United State lagging in engineers? "It's baffling," admits Bolz. "We suspect we possibly scare away those who might consider engineering by putting so much emphasis on mathematics."

Noting that math is not historically attractive to youngsters and that they may lack the patience for problem solving, Bolz thinks, however, that new trends in math instruction may correct this negative aspect."

WITH BEST WISHES TO ALL OF YOU AND LOOKING FORWARD TO SEEING MANY OF YOU BACK WITH US AGAIN ON MAY 4.

MOST SINCERELY,

Joseph H. Koffolt, Chairman
Chemical Engineering Department

JHK:mut

COLLEGE OF ENGINEERING ENROLLMENT, AUTUMN QUARTER, 1961

	1st Year			2nd	Tot Pre	3rd	4th	5th	5th	Tot	SUM
	New	Other	Tot.	Yr.	Engr	Yr.	Yr.	Yr.	Comb. Prog.	Prof. Engr.	TOTAL
Aero	64	12	76	44	120	20	27	14	1	62	182
Agr E	2		2	5	7	8	3	8	6	25	32
Cer E	23	1	24	20	44	9	12	4	2	27	71
Chem E'61	84	8	92	61	153	23	18	9	12	62	215
'60	69	6	75	45	120	23	17	26	13	79	199
'59	68	7	75	35	110	23	25	26	16	90	200
'58			79	29	108	44	34	27	9	114	222
'57			72	62	134	48	39	21	5	113	247
'56			89	66	155	47	29	19	10	105	255
'55			85								221
'54			79	48							206
'53			75	48							183
Civil E	53	9	62	51	113	34	46	42	5	127	240
Elec E	149	33	182	149	331	70	88	69	9	236	567
Indust E	18	1	19	22	41	23	34	29	2	88	129
Mech E	63	10	73	74	147	28	72	44	7	151	298
Met E	12	3	15	6	21	4	10	6	4	24	45
Mine E				5	5	1	5	4	2	12	17
Pet E								5		5	5
Physics	17	3	20	36	56	18	24	6	8	56	112
Weld E	1		1	8	9	12	8	8	2	30	39
Und	303	45	348	150	498						
Totals	789	125	914	631	1545	240	347	248	60	905	
Total Engr.											2450

SCHOOL OF ARCHITECTURE AND LANDSCAPE ARCHITECTURE

Arch	62		62	55		32	30	21		200	200
Land Arch	8		8	7		5	7			27	27
Total Reg	859	125	984	693		287	384	269	60	2677	2677
Irreg											24
Part-time Educ. Oppor.											287
Grand Tot											2988

Included in above totals:

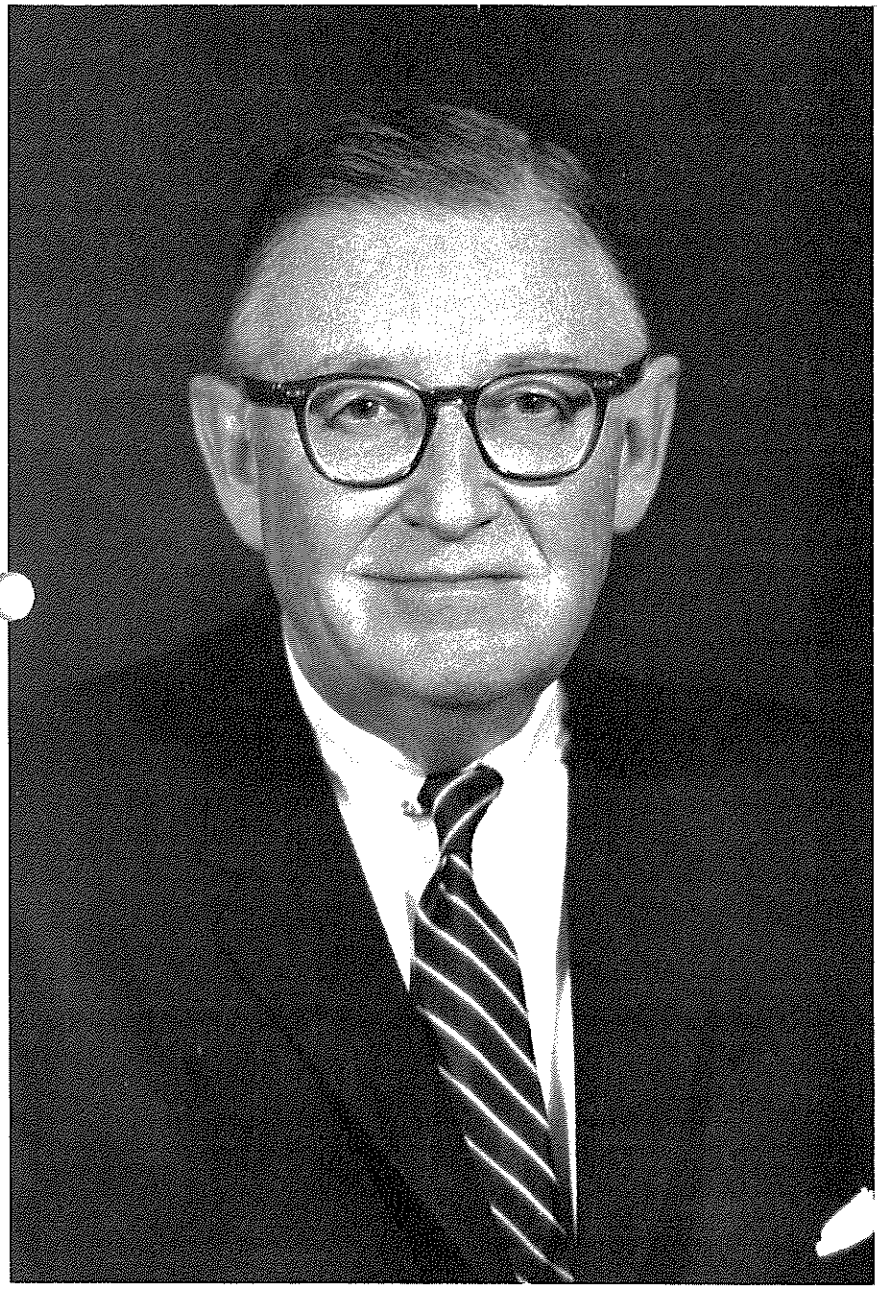
Lima - 54, Mansfield - 23, Marion - 15, Newark - 16, Wright Field - 167

THE FUTURE OF CHEMICAL ENGINEERING

BY

JOHN J. HEALY, JR. PRESIDENT, AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

CORPORATE PLANNING, MONSANTO CHEMICAL COMPANY, ST. LOUIS MO.



The following speech was delivered by John J. Healy at the President's Luncheon, Annual Meeting of the American Institute of Chemical Engineers in New York City, December 4, 1961.

Backward, turn backward, o time in thy flight
Make me a boy again just for tonight.

I suppose that these words of wisdom might properly be the keynote for a discussion of the future of a profession that is 60 years old, and of a society that is 53 years old, by an individual who has some time ago reached the age of reason. But let me assure you that I do not intend to fly backward to see where we are going, even though some historical incidents may be pertinent. The good old days were good only in terms of the environment then existing, the new days will be better, even though paradoxically the environment will be worse. The required reading for this course is the report of the Committee on Dynamic Objectives. The future of chemical engineering, the future of chemical engineers, the future of the American Institute of Chemical Engineers is bright with renewed, revitalized, dynamic, if I may abuse that word again, opportunity.

Why talk about the future of Chemical Engineering? Is there any doubt that there will be a need for chemical engineering and chemical engineers? No-- but there are alarms and excursions about competitive conditions and profit conditions in the so-called chemical industry. I quote from abstract number 155 "Chemical Industry Competition," a paper to be given at this meeting by Mr. C. G. Boland:

"Chemical companies historically making up the industry are meeting increasing competition from companies losing markets to chemicals, those having chemical raw materials, and those with diversification plans."

This is certainly true domestically, and we can add to it the threats of European competition and Japanese competition based on cheap labor, and Russian competition based on an entirely different social concept.

This is a change. Thirty years ago the "chemical industry" as then defined, was confined to relatively few companies, each of which had certain areas of exclusivity. Chemical engineers were comparatively rare birds (the Institute had 1,000 members in 1931). Walker's principles were being taught and the chemical engineers who were being taught them did learn something about the application of mathematics and physics to the solution of chemical engineering problems. However, the ability to use these disciplines in depth was dependent on the slide rule and not the computer, and the incentive for really rigid use, particularly in certain exclusive areas, was not always present.

However, the last decade, at least in the chemical industry, has witnessed a change. There has been an apparent decline in the ability or the willingness to invent and protect technological exclusivity of any major nature. The reasons for this are several:

The tremendous impact of Government-sponsored production facilities and research;
The increased availability of satisfactory technological know-how;
The increase in the number of competent scientific and engineering personnel;
The increase in availability of large capital funds;
The very attractive traditional high rate of return on capital in the chemical industry.

The result has been the entrance of a number of new companies into the field and a high degree of competition.

The growth potential of chemicals has not been destroyed by this competitive situation. The significant point is that this growth will apparently be characterized by the greatest technological competition in the industry's history. Profitable expansion will be dependent in large measure upon the ability of the chemical engineer to develop new concepts of design which will enable the industry to maintain, and even enhance, its desirability as a capital investment. The conditions surronding the premises for design are changing, and will continue to change markedly. Chemical engineers will encounter a diversity of products and processing techniques, and with continuing stiffening economic competition, they must understand and exploit many new technologies.

This to me indicates a bright future for chemical engineering and chemical engineers. There will be no lack of opportunity to exercise chemical engineering, and the chemical engineer will not cease to exercise the basic function first outlined by Walker, and reaffirmed in the report of the Committee on Dynamic Objectives. This basic function is the utilization of chemical, physical, and mathematical principles to reduce chemical processes to large scale economical operation.

The challenge of this opportunity is great. It will demand of practicing engineers, greater knowledge and greater skill and judgment in applying it, men who can be truly creative in spite of the restrictions imposed by the need for economy, men who are not just fond of their profession, but love it passionately, men who take pride in their "skill in doing well with one dollar what any bungler can do with two." I imagine that I should add that popular cliche to the effect that the job is going to be tough. I don't believe it--to me the job appears to be delightful for any man truly interested in demonstrating his professional skill.

The argument then is not that there will be no need for chemical engineering or chemical engineers, but rather what concepts, and what tools shall the chemical engineer use in the practice of his profession in order to bring about most rapidly the advances that will be needed in order to stay in business. The report of the Committee on Dynamic Objectives infers that the chemical engineer has reached his limit in the application of the concepts of unit operations and is now in the position of the electrical engineer who is trying to get a few more tenths of a precent of efficiency out of a generator. The answer to this, so the report says, is a closer relationship to chemistry and a greater training in depth in what are called the "engineering sciences" plus a rigorous training in the mathematics necessary to understand them and to interpret them in terms of final design. In the original report, although I am unable to find it in the published one, it was stated that purely physical operations are not at present offering the opportunities that they did in the past, and ability and a pragmatic approach based on scientific procedures will lead to the greater rewards. I find myself inclined to argue some with the statement about a few tenths of a percent, and to argue also with the elimination of the term "pragmatic approach." I am convinced that chemical engineers and chemical engineering will continue to be concerned with that few tenths of a percent. The gain of a few tenths of a percent in yield or in cost today, where many of our operations are on a very sizeable scale, can mean the gain of a substantial number of dollars. The pragmatic approach will not disappear entirely, and we will continue to have breakthroughs as long as the engineer is bold enough at times to use the pragmatic approach where scientific background is lacking. However, I also believe we must also recognize that a greater training in depth in chemistry, physics, and mathematics, a greater ability to translate the engineering sciences into terms of practical design, a greater understanding of the implications and limitations of developments of other engineering disciplines, all will make the use of the pragmatic approach less necessary, and certainly will be essential if a process developed upon such an approach is to remain competitive. Even those gains of a few tenths of a percent should become more readily recognized and more easily attainable

However, regardless of the tools that will be used, whether they be unit operations, systems engineering, mathematical concepts, or computers, we must continually keep in mind that the tools are not an end in themselves. The important end is process improvement through major reductions in capital cost, if possible. For instance, I recently heard an interesting paper concerning mass transfer and energy relationships in a catalyst bed in a sulfuric acid converter. Undoubtedly this work will lead to improvements in operation, probably on the order of the few tenths of a percent that we are talking about. However, it recalled to my mind that the major revolution that took place in the 1920's in sulfuric acid engineering was not due to the application of these or similar principles to the process that then existed, but rather due to the

fact that someone saw that a major reduction in capital expenditure could be brought about if a catalyst that was non-poisoning could be developed. Such a catalyst was developed, and even though in the early days its performance from the heat mass energy transfer standpoint was not outstanding, it did result in cutting in half the capital cost necessary to build a contact sulfuric acid plant. Chemical engineers must constantly keep their eyes open for better and more simple systems, and not become too enamored with the system that is already in existence.

We will need educators who are unwilling to seek refuge in the mere abstractions of science and mathematics but have the courage to face the fact that chemical engineering demands practical application and, therefore, requires that there must be imparted to the student some idea of the translation of science and mathematics to application which will enable the chemical engineer to arrive at application within a somewhat reasonable future.

I am happy to say that I am confident that we can rely upon our educators to do this job. At the recent 25th Anniversary Congress of the Society of Chemical Engineers, Japan, American chemical engineering education was represented by an outstanding group -- men such as Wilhelm, White, Wilke, Marshall, Hottel, Rushton. Not only did they demonstrate a grasp of theory based on a knowledge of chemistry and physics, but they also demonstrated a great skill in the application of mathematics in the elucidation of this theory, and above all, a practical realization of the extent to which theoretical and mathematical concepts were of value in reducing these concepts to practical plant design and operation. This must have been impressive to the Japanese; it certainly was impressive to me, and convinced me that our chemical engineering education is in sound hands.

The need exists; the challenge is there, and the educational ability is not lacking. Will there be enough people interested in chemical engineering to want to tackle the job? Figures published recently by the Massachusetts Institute of Technology, figures recently obtained by the Institute from twelve representative chemical engineering institutions, all indicate a substantial decline in enrollments and in degrees granted in chemical engineering over the last four years. Those of you who read "The New York Times" have noticed that the Engineering Manpower Commission made the front page of last Sunday's edition with the headlines, "Engineer Shortage Grows; Soviet Lead Worries Panel-- Fewer College Freshmen take course, with Sharpest Drop in East -- 6-Year Depening of Scarcity Expected."

It is obvious from these figures that the image of chemical engineering and engineering in general as a professional career is not as attractive as the image of science. Presumably this is in part a result of the publicity that glamorized the scientist and not the engineer. Also, I am sure there is the feeling that science offers full play for a man's creative instinct whereas engineering, because it is restrictive in terms of efficient utilization of men, materials, and money, inhibits creativity. Personally, I do not agree that creativity is hampered by restrictions; rather I think it is enhanced. Furthermore, the creativity of chemists will lie idle upon the shelves unless we have men skilled in the reduction of chemical discovery to economical useful practice, that is, chemical engineers.

I realize that there are people in the profession who feel that a shortage would be a good thing since it would result in a type of closed shop with a resultant much higher salary scale. This type of thinking is not only un-profession, but it is shortsighted, and if it were to become the popular concept, nothing would kill the profession more quickly. We who enter in the profession must take a greater interest in seeing to it that the nature of our job and the satisfaction that doing this job brings, are clearly outlined to promising young men.

Let us keep well in mind that it is the objective and the duty of engineers constantly to strive to improve the standard of living. Do we understand that we are professional men because our objective is the public welfare, that we fail of our purpose and our right to respect if we connot or do not use our technical training to produce more goods of better quality at higher wages and lower costs, and that of all professions, engineering, and particularly chemical engineering, because of the multitudinous possibilities of the chemistry with which it deals, is the only one which really contributes to an improved standard of living.

Those of us who are not convinced of this and have a strictly selfish viewpoint of self-interest should bear in mind that the switch from engineering to science does not necessarily mean that there will be a shortage of chemical engineers. I quote this from a recent news item in "The New York Times" concerning the revision of engineering education at Yale:

> "It is much easier for the scientist to convert himself into an engineer than for the trained engineer to master the new science required for a dynamic technology,"

Finally, what about the American Institute of Chemical Engineers. A strong professional society has an extremely important part to play in this revolution and evolution. It is the connecting link which, through an active and interested membership, establishes and supervises the necessary educational standards and transmits effectively their implications for future practice to members of the profession and to the chemical industry. The professional society has a responsibility to institute and foster career guidance programs that will educate the youth of the country to the importance of chemical engineering. Science and engineering are complementary, and without good engineering the benfits of science in increasing the standard of living and the economic well-being of the country would be materially delayed, if not entirely prevented. The professional society is the logical mechanism for appraisal of the content of chemical engineering curricula in the light of the present and near future needs of the economy, and it is the logical mechanism for continuing the education of the chemical engineer after graduation through its publications and meetings.

Only a professional society can establish for members of the profession that atmosphere which is known as the "professional climate," that is, the recognition by the public of chemical engineering as a profession, the recognition by members of the profession that a professional attitude, based on principles of ethical conduct and individual merit, is necessary for professional recognition, and the recognition by industry that chemical engineers practicing the profession should be utilized in a manner which is worthy of their skill and compatible with their dignity.

I know that the American Institute of Chemical Engineers is a strong professional society, not only because it has a dedicated and hard working staff, but even more importantly, it has individuals as members who are not rubber stamps and who are willing at all times to voice their opinion about Institute affairs as they see them. The outstanding work of many of our committees makes it very apparent that there are many individuals in this organization who carry in their hearts a love and respect for their profession, and give to it a service that is far above anything that can be expressed in dollars. As long as we can continue to maintain this spirit, the American Institute of Chemical Engineers will continue to play a most important part in the future of chemical engineering. Now, since I started off with a bit of verse let me end with some--

The shades of night were falling fast,
When through an Alpine Village passed,
A youth who bore in snow and ice
A banner with this strange device --
Excelsior.

"Industrial Research" by F. Russell Bichowsky (1942, Chemical Publishing Co., Inc.

Mr. Bichowsky says:

"Under the glass top of the desk of every executive and chief engineer should be a copy of the carefully documented arguments by which the State Engineer of New York conclusively proved that the railroad could never compete with the canal. The following passage from McMaster's 'History of the People of the United States' gives the same argument in more popular language:

> "Canals . . . are facts; railroads are theories, and are opposed to the habits and feelings of our people, for they create monopolies in transportation. A farmer cannot own railroad wagons. But for a few hundred dollars he can buy a boat, or with the help of his hands can build one to carry twenty-five tons. To move such a load by railroad would require eight carriages and a locomotive costing $4,000. Into his boat the farmer can put an assorted cargo of flour, bacon, hemp, plank, lumber and vegetables, draw it to market with his own horses, sell it at any village on the way and bring it back loaded with what he pleases. Does anybody suppose railroads will take on loads offered anywhere along the line? No, indeed! The farmer must haul them to the stopping places. Canals will carry livestock, hay, firewood, large timbers for ships, building boards and planks. Railroads cannot do this. What would be thought of a load of hay coming along a railroad? The sparks from the locomotive would set it on fire before the journey began. Canals are adapted for military purposes; railroads are not. Imagine a regiment of troops with baggage, provisions, ammunition and camp equipage transported by railroads! By canal this can be done and the soldiers live and cook comfortably on the way. The boats will carry tents, foods, baggage and ammunition and may be drawn by the horses or by the men as they walk along the towpaths. Canal boats will carry artillery which cannot be transported by rails unless the guns are dismounted and the caissons taken apart. Snow will make a three hundred mile railroad impassable for weeks. Rain will wash earth over the rails in quantities which in deep cuts will take weeks to remove. Railroads for long distances are wholly untried in any country and for short distances are in the experimental stage. The longest in existence, the Manchester and Liverpool, is but forty miles in length and passes through the heart of a populous country and may anywhere get aid to repair cars, wagons and engines. But such a railroad as the Baltimore and Ohio ten times as long running through a rough, wild and sparsely inhabited country with great difficulties of construction to overcome should ever compete with a canal of the same length as the Chesapeake and Ohio surpasses probability.
>
> If steam locomotives were used it would be necessary to have water-boiling stations every six or seven miles to furnish the engines with tanks of boiling water for a supply of cold water would stop the generation of steam and stop the train.
>
> Rails would be taken by passing teamsters wantonly as they did milestones and coping of bridges, or from spite towards a means of transportation likely to injure their business. In the mountains the cold of the winter is often so severe that an axe will break when struck against a tree. Would not rails snap under these conditions as a train passed over them?"

DECEASED CHEMICAL ENGINEERING ALUMNI

(Number in Parenthesis Indicates Number of Graduates that Year)

1907 (6)
1. Harry R. Drackett
2. Harry E. Surface
3. Dana J. Demorest

1908 (5)
1. Frank M. Dorsey
2. Charles P. Hoover
3. Paul McDorman
4. Arthur C. Nothstine,Jr.
5. Harry M. Williams

1909 (6)
1. Erwin Sohn
2. O. R. Sweeney

1910 (7)
1. Ernest H. Grant
2. William D. Lareaux
3. W. A. Richey
4. Lear H. Van Buskirk
5. P. S. Beebe

1911 (10)
1. Harry V. Atkinson
2. Sumner B. Frank
3. Roscoe C. Jones
4. Clarence B. King
5. C. J. Burkley
6. Albert W. Davison
7. Howard Dock
8. Ralph E. Hall

1912 (11)
1. E. S. Boerstler
2. F. J. Montgomery
3. C. E. Vert

1913 (11)
1. Henry N. Case
2. Albert N. Erickson
3. Charles R. Parkinson
4. Reuben L. Walter
5. Howard E. Fritz

1914 (19)
1. Emil H. Balz
2. W. T. Burgoon
3. Paul Cottringer
4. A. A. Chambers
5. Roy D. Fritz
6. L. A. Gregg
7. Edward G. Hines
8. Brice Stewart Hull
9. Lesley S. Jenkins
10. Arthur R. Willis
11. P. R. Morris

1915 (20)
1. C. R. Bennett
2. Walter M. Berger
3. Ralph Peter Heikes
4. H. L. Dick
5. Carl W. Simpson
6. J. W. Melick
7. J. O. Lord
8. G. D. Evans

1916 (16)
1. M. A. Muskopf
2. Hanford A. Thirey
3. K. W. Reed
4. F. C. Vilbrandt

1917 (16)
1. Carl E. Aungst
2. Walter L. Krueger
3. William A. Wirth
4. D. F. Alexander
5. F. L. Sinks
6. H. H. Thompson
7. Fred N. Schaad

1918 (18)
1. G. A. Burrell
2. Aubrey E. Hess
3. Garland H. Hufford
4. Edwin W. Mann
5. H. Alton Mitchell
6. J. M. Ort
7. A. H. Vilbrandt
8. A. E. Galloway
9. J. H. Young

1919 (7)
1. Howard F. Anders
2. J. G. Ralston

1920 (32)
1. Haney C. Howell
2. Louis J. Mathies, Jr.
3. Roy Pastor
4. Victor J. Roehm
5. Harold T. Reiner-Ruff
6. Carroll L. Strait
7. Joseph M. Volzer

1921 (29)
1. Walter F. Spear
2. W. K. Gilkey

1922 (33)
1. Paul R. Hines
2. Walter L. Klaiber
3. Roland M. Kohr
4. R. E. Wolfe
5. R. E. Whinery
6. Wallace Wing
7. Ben Blumenthal
8. Carl J. Beckert
9. C. A. Ritchie

1923 (60)
1. R. T. Donham
2. Albert G. Corwin
3. James T. Goff
4. William J. Harrison
5. G. R. Lyon
6. J. L. Roberts
7. J. L. Ware
8. E. N. Prinz

1924 (28)
1. Carroll M. Allen
2. Raymond S. Carter
3. John LeRoy Ware
4. C. Weis
5. George W. Ruhl

1925 (35)
1. Lorin E. Lutz
2. Frederick H. MacLaren
3. Adolph Valley
4. John Bowers
5. Chennan Shen

1926 (14)
1. J. L. Thomas

1927 (19)
1. Charles E. Hammett
2. Dwight S. Masters
3. Edwin F. Nussdorfer
4. Charles R. Owens
5. L. E. Mong

1928 (19)
1. Thomas C. Chadwick

1929 (24)
1. James Pace Alton
2. Ming Tan Hsieh
3. W. J. Michel

1930 (34)
1. G. B. Malvea
2. K. M. Sprinkel
3. J. L. Arns

DECEASED CHEMICAL ENGINEERING ALUMNI (CONTINUED)

1931 (43)
1. T. W. Elslager
2. Adolph Wassertheurer

1932 (40)
1. Conrad F. Daum
2. David M. Goodfriend
3. Alfred E. Galloway
4. E. C. Piotter
5. H. L. Sittler

1933 (42)
1. Francis E. Pickering

1935 (66)
1. Harvey C. Gillogly

1936 (42)
1. Robert L. Scroggs

1937 (53)
1. Richard M. Abbott
2. Clare O. Ewing, Jr.
3. Leon W. Omwake
4. William C. Shank
5. E. H. Osborne
6. James Braden

1938 (71)
1. D. J. Gaston
2. Howard J. Orlowski
3. Alexander Newhouse

1940 (73)
1. John Robert Linn
2. F. Wayne Beall

1942 (67)
1. Vaughn E. Kelly
2. Julian Adam Yocum

1943 (90)
1. M. F. Dick

1944 (28)
1. K. E. Kress

1945 (14)
1. Roland L. Allen
2. Charles J. Speitz, Jr.

1947 (103)
1. Sidney Miller

1948 (147)
1. D. L. Wiggins
2. Robert J. Wygal

1949 (132)
1. Thomas O. Feasel
2. John W. Shook, Jr.

1950 (87)
1. Robert C. Johnston

1951 (103)
1. Turney Ferguson
2. John R. Seferian

1953 (45)
1. Abe Ali Muhammad Al-Kazimi

1955 (57)
1. Fred C. Ohnmeiss

LOST, STRAYED OR STOLEN ALUMNI IN CHEMICAL ENGINEERING

IF YOU KNOW THE ADDRESS OF ANY OF THESE, WE WOULD APPRECIATE IT VERY MUCH IF YOU WOULD INFORM US.

1910
1. C. G. Wood-M.Sc.

1913
1. A. N. Erickson-B.Ch.E.
2. Frederick C. Smith-B.Ch.E.

1915
1. Kenneth Kersey-B.Ch.E.
2. Harry Mitzen-B.Ch.E.

1917
1. W. J. King-M.Sc.
2. Earl R. Schafer-B.Ch.E.

1919
1. C. C. Keckler-B.Ch.E.

1920
1. Yu Seng Tsen-M.Sc.

1921
1. C. M. Evans-B.Ch.E.
2. Henry W. Hess-B.Ch.E.
3. R. D. Kumajon (Formerly Osgerichian) B.Ch.E.
4. Kao Shen

1922
1. Klahr A. Cover-B.Ch.E.
2. En-Fou Lee-Toma-M.Sc.
3. Vernon R. Morris-B.Ch.E.
4. Chang Uyen Pang-B.Ch.E.

1923
1. A. F. Acosta-B.Ch.E.
2. H. M. Davies-B.Ch.E.

1924
1. Tien I. Chen-M.Sc.

1925
1. Marion C. Reed-Ph.D.
2. S. M. Sun-M.Sc.

1926
1. Ford C. Davis-B.Ch.E.
2. J. A. Thompson-M.Sc.
3. Mao Han Tuan-B.Ch.E.

1927
1. Cheung Ying Chu-M.Sc.

1928
1. E. E. Martin-B.Ch.E.

1930
1. Chieh Ma-Ph.D.
2. Wei Yang-Ph.D.

1931
1. Mrs. Hao Feng Yun Hsiang-Ph.D.

1934
1. B. A. Bowman
2. Raymond Tseng-Ph.D.

1935
1. E. C. Painter-B.Ch.E.

1937
1. Robert V. Cobb

1938
1. Howard D. Evans, Jr.-B.Ch.E.
2. L. W. Love-B.Ch.E.

1942
1. Valeb Khamneizadeh-M.Sc.

1948
1. Lucille DeChant King-B.Ch.E.
3. Lan Ching Wang -M.Sc.

1949
1. Chi-Ti Pan - M.Sc.

1950
1. Vopinchandra Nanavati-M.Sc.

1951
1. Rai Tsing Lee-M.Sc.
2. En-Tsch Ming-Ph.D.

1952
1. Roy Choudhury-M.Sc.
2. Hamid Al-Ahmad-B.Ch.E.

1954
1. Charles C. Thacker, Jr.-M.Sc.