GRADUATE ANNOUNCEMENTS for September, 1951—June, 1953 of THE RICE INSTITUTE FOUNDED BY WILLIAM MARSH RICE

OPENED FOR THE RECEPTION OF STUDENTS IN THE AUTUMN OF NINETEEN HUNDRED AND TWELVE

Dedicated to the Advancement of Letters, Science, and Art

HOUSTON, TEXAS
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## ACADEMIC CALENDAR

### 1951

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<thead>
<tr>
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<tbody>
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<td>September 20-21</td>
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<tr>
<td>September 22</td>
<td>Matriculation Address</td>
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<tr>
<td>September 24</td>
<td>Opening of Courses</td>
</tr>
<tr>
<td>November 21</td>
<td>Beginning of Thanksgiving Recess at 6:00 P.M.</td>
</tr>
<tr>
<td>November 26</td>
<td>Resumption of Courses at 8:00 A.M.</td>
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<tr>
<td>December 22</td>
<td>Beginning of Christmas Recess at 1:00 P.M.</td>
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### 1952

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<th>Date</th>
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<tbody>
<tr>
<td>January 7</td>
<td>Resumption of Courses at 8:00 A.M.</td>
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<tr>
<td>January 28-February 7</td>
<td>Midyear Examinations</td>
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<tr>
<td>February 11</td>
<td>Resumption of Courses at 8:00 A.M.</td>
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<tr>
<td>April 10</td>
<td>Beginning of Easter Recess at 6:00 P.M.</td>
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<tr>
<td>April 15</td>
<td>Resumption of Courses at 8:00 A.M.</td>
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<td>April 26</td>
<td>Main Entrance Examination Period</td>
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<td>May 23</td>
<td>Beginning of Final Examinations</td>
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<tr>
<td>June 1</td>
<td>Baccalaureate Exercises</td>
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<tr>
<td>June 6</td>
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<td>June 21</td>
<td>Second Entrance Examination Period (principally for transfers)</td>
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<tr>
<td>January 5</td>
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<td>January 26-February 5</td>
<td>Midyear Examinations</td>
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<td>February 9</td>
<td>Resumption of Courses at 8:00 A.M.</td>
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<td>April 2</td>
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<td>April 7</td>
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<td>April 25</td>
<td>Main Entrance Examination Period</td>
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<td>Beginning of Final Examinations</td>
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<td>Fortieth Commencement</td>
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<td>June 20</td>
<td>Second Entrance Examination Period (principally for transfers)</td>
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V
EDGAR ODELL LOVETT, Ph.D., Sc.D., LL.D.  
*President Emeritus*

OFFICERS OF ADMINISTRATION

WILLIAM VERMILLION HOUSTON, Ph.D.  
*President*

JAMES CADDALL MOREHEAD, JR., B.Arch.  
*Assistant to the President*

GEORGE HOLMES RICHTER, Ph.D.  
*Dean*

GUY THORNTON McBRIDE, JR., Sc.D.  
*Associate Dean for Students*

SAMUEL GLENN McCANN, M.A.  
*Registrar*

JOSEPH DAVID THOMAS, A.M.  
*Assistant Registrar*

JOHN THOMAS McCANTS, M.A.  
*Bursar*

VERNE FRANKLIN SIMONS, A.M., C.P.A.  
*Assistant Bursar*
TRUSTEES EMERITI
ALEXANDER SESSUMS CLEVELAND
EDGAR ODELL LOVETT
BENJAMIN BOTTS RICE
JOHN THADDEUS SCOTT

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GUS SESSIONS WORTHAM: VICE-CHAIRMAN
FREDERICK RICE LUMMIS: SECRETARY-TREASURER
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FRANCIS TARRANT FENDLEY
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JOHN SMITH IVY
ROBERT HILLYER RAY
HARMON WHITTINGTON
GRADUATE ANNOUNCEMENTS FOR
SEPTEMBER, 1951—JUNE, 1953
THE RICE INSTITUTE

GENERAL STATEMENT

The Rice Institute bears the name of the founder, the late William Marsh Rice. Dedicated to the advancement of literature, science, and art, its educational program of liberal and technical learning may justify the designation “Institute” as representing the functions of a teaching university and, at least in some of its departments, those of a research institution. The Institute was incorporated in 1891 under a broad charter granting the trustees large freedom in the future organization of a non-political and non-sectarian institution to be dedicated to the advancement of letters, science, and art.

Since the opening in 1912, the highest ideals of scholarship have been upheld, and graduate study and research have been carried on as a principal means of advancing the several fields of learning. The degree of Doctor of Philosophy has been awarded in the fields of mathematics, physics, chemistry, biology, and history. This degree represents the completion of at least three years of advanced study after the award of a suitable bachelor’s degree, and in most cases four or more years are required. It also represents the completion of an original piece of investigation, the report of which constitutes the thesis. The thesis must be deposited in the Institute library in accordance with the established regulations (see below). As final evidence of his preparation for this degree, the candidate must pass a public oral examination.

The degree of Master of Arts is available in the foregoing and other fields of study, and the degree of Master in Architecture or Master of Science in a branch of engineering (M.S. in Ch.E., M.S. in C.E., M.S. in E.E., or M.S. in M.E.) may be obtained. Each of these degrees represents the completion of at least one full year of advanced work in a special field. Such programs will generally include a piece of original work embodied in a thesis, and the candidate’s preparation will be evidenced by a public examination. Students whose undergraduate preparation has not
included sufficient specialized work, or whose time is partly occupied with teaching duties, may require at least two years to complete the requirements for a master's degree.

Language requirements for advanced degrees are as follows:

A candidate for the master's degree will be expected to demonstrate a reading knowledge of either French or German to a committee composed of one representative of the appropriate language department and one representative of the candidate's major department.

A candidate for the degree of Doctor of Philosophy is expected to satisfy his language requirements at least one year before the date on which the degree is granted. He will be expected to demonstrate a reading knowledge of either French or German to a committee composed of one representative of the appropriate language department and one representative of the candidate's major department. In addition, he will be expected to demonstrate to the satisfaction of his major department a reading knowledge of one other language approved by the major department.

The following regulations govern the deposit of all theses. Candidates should apply to the Librarian for detailed instructions concerning format.

1. Three copies of the thesis, in final form, should be presented to the professor in charge of the thesis work not later than May 15. It should be fastened together in such a way as to avoid loss or mutilation of pages, but without punching any holes in the sheets. A compression binder is recommended.

2. After securing the approval, on the title page, of the professor in charge of the thesis, the candidate should present three copies in Manila envelopes to the secretary of the Librarian, together with the fee to cover the cost of binding. This must be done at least four days before the commencement at which the degree is to be awarded. The fee for binding is $2.50 per copy. Theses more than one inch thick must be bound in more than one volume. Candidates may have extra copies bound for their own use at the above rate.

By special arrangement with the head of the department in which he is specializing, a graduate student who is already a candidate for an advanced degree may enroll in an approved research course during the summer. Such enrollment will be for a twelve-week period starting with the end of the regular academic year. Laboratory fees only will be charged.

The courses listed in this bulletin have been given in recent

\[1\text{In cases of candidates for degrees to be awarded before June, 1955, the Committee on Graduate Instruction may recommend appropriate exceptions.}\]
years or have been announced for the near future. Not all are repeated annually, and modifications or additional courses are likely to be introduced from time to time. Offerings for each academic session are shown on the printed time schedule distributed at the September registration. At all other times, the latest information about future offerings can be secured from the Office of the Registrar or from department heads. Instructors of courses, as named at the lower right of course descriptions, are subject to change.

Applicants for admission to graduate study are advised to take the Graduate Record Examination, arrangements for which may be made by writing to the Educational Testing Service, P. O. Box 592, Princeton, New Jersey. Since the Rice Institute maintains an examination center for local supervision of the examinations, applicants in the Houston area may make the necessary arrangements by applying in person at the Office of the Registrar. Preference will be given to applicants who earn high scores on examinations given by this organization. At the discretion of the Committee on Graduate Instruction, the Graduate Record Examination or other examinations may be required of individual applicants.

Application for admission to graduate study should be made to the Registrar as early as possible.
INSTRUCTIONAL STAFF

FACULTY

AGMON, SHMUEL
M.S. (Jerusalem) 1947, Docteur ès Sciences (Paris) 1949
Lecturer in Mathematics

AKERS, WILLIAM WALTER
B.S. in Ch.E. (Texas Tech.) 1943, M.S. in Ch.E. (Texas) 1944,
Ph.D. (Michigan) 1950
Assistant Professor of Chemical Engineering

ALTENBURG, EDGAR
A.B. (Columbia) 1911, A.M. (Columbia) 1912, Ph.D. (Columbia) 1916
Associate Professor of Biology

BANG, THØGER S. V.
Cand. Mag. (Copenhagen) 1939, Dr. Phil. (Copenhagen) 1946
Visiting Lecturer in Mathematics

BATTISTA, JOSEPH LLOYD
Certificat d'Etudes françaises (Bordeaux) 1919, Diplôme
d'Études supérieures (Bordeaux) 1919, B.A. (Michigan) 1920,
Assistant Professor of Romance Languages

BLACK, HUGH CLEON
B.A. (Rice) 1941, M.Ed. (Texas) 1947, Ph.D. (Texas) 1949
Assistant Professor of Philosophy and Education

BONNER, TOM WILKIERSON
B.S. (Southern Methodist) 1931, M.A. (Rice) 1932, Ph.D. (Rice)
1934
Professor of Physics

BOURGEIOIS, ANDRÉ MARIE GEORGES
Bachelier ès Lettres (Paris) 1921, Bachelier en Droit (Paris)
1923, Certifié d'Études supérieures de lettres (Paris) 1930, M.A.
(Texas) 1934, Docteur d'Université (Paris) 1945, Officier de l'Instruction Publique 1945
Associate Professor of French

BRAY, HUBERT EVELYN
B.A. (Tufts) 1910, M.A. (Harvard) 1916, Ph.D. (Rice) 1918
Professor of Mathematics

BROOKBANK, RICHARD LINK
A.B. (Washington) 1936, Sonderzeugnis (Munich) 1939
Instructor in German

BRUNK, HUGH DANIEL
A.B. (California) 1940, M.A. (Rice) 1942, Ph.D. (Rice) 1944
Assistant Professor of Mathematics

CAMDEN, CARROLL
A.B. (Centre) 1925, M.A. (Iowa) 1928, Ph.D. (Iowa) 1930
Professor of English

CHANDLER, ASA CRAWFORD
B.A. (Cornell) 1911, M.S. (California) 1912, Ph.D. (California) 1914
Professor of Biology

CHAPMAN, ALAN JESSE
B.S. in M.E. (Rice) 1945, M.S. (Colorado) 1949
Assistant Professor of Mechanical Engineering

CHILLMAN, JAMES, JR.
B.S. in Arch. (Pennsylvania) 1913, M.S. in Arch. (Pennsylvania) 1914, F.A.A.R. (Am. Acad. in Rome) 1922
Professor of Architecture

CRAIG, HARDIN, JR.
Professor of History

DAUGHERTY, JACK WOODWARD
A.B., B.S. (Southeast Missouri) 1939, A.M. (Missouri) 1940, Ph.D. (Wisconsin) 1949
Assistant Professor of Biology
DAVIS, JACk F.
B.S. (Livingston State Teachers College) 1949
Assistant Professor of Physical Education

DEZORKO, EDWARD R.
B.S. in Ed. (Illinois) 1939, B.S. in Arch. (Illinois) 1940, M.S. in Arch. (Columbia) 1942
Associate Professor of Architecture
(On leave of absence 1950-51)

DICKER, JAMES LAFAYETTE, III
B.A. (Vanderbilt) 1949, M.A. (Vanderbilt) 1950
Instructor in English

DIX, WILLIAM S.
B.A. (Virginia) 1931, M.A. (Virginia) 1932, Ph.D. (Chicago) 1946
Associate Professor of English and Librarian

DOWDEN, WILFRED SELLERS
B.A. (Vanderbilt) 1939, M.A. (Vanderbilt) 1940, Ph.D. (North Carolina) 1949
Assistant Professor of English

DUNAWAY, JAMES KARL
B.A. (Rice) 1936, B.S. in Arch. (Rice) 1937, M.A. (Rice) 1938, M.S. (Columbia) 1941
Associate Professor of Architecture

FISCHER, KATHERINE MARTHA
B.A. (Rice) 1944, M.A. (Rice) 1945, Ph.D. (Cornell) 1950
Assistant Professor of History

FREUND, FRIEDRICH ERNST MAX
Ph.D. (Leipzig) 1902
Professor Emeritus of German

FULTON, JAMES STREET
B.A. (Vanderbilt) 1925, M.A. (Vanderbilt) 1929, Ph.D. (Cornell) 1934
Associate Professor of Philosophy
FURUBOTN, EIRIK G.
A.B. (Brown) 1948, A.M. (Columbia) 1949
Instructor in Economics

GALLEGLY, JOSEPH S., JR.
B.A. (Rice) 1925, M.A. (Rice) 1926
Assistant Professor of English

GARRISON, ALLEN DARNABY
B.A. (Rice) 1918, M.S. (Rice) 1920, Ph.D. (Rice) 1921
Associate Professor of Chemistry

GATES, GERALD F.
B.F.A. (Syracuse) 1943, M.F.A. (Colorado) 1949
Assistant Professor of Architecture

GENTILE, RALPH
D.Ind.E. (Rome) 1938, D.C.E. (Rome) 1940
Assistant Professor of Electrical Engineering

GILES, JAMES BERNARD
B.B.A. (Texas) 1936, M.A. (Texas) 1937
Assistant Professor of Economics

HARTSOOK, ARTHUR J.
A.B. (Nebraska Wesleyan), 1911, S.B. in Ch.E. (M.I.T.) 1920,
S.M. (M.I.T.) 1921
Professor of Chemical Engineering

HEAPS, CLAUDE WILLIAM
B.S. (Northwestern) 1909, Ph.D. (Princeton) 1912
Professor of Physics

HERMANCE, GILBERT LESLIE
B.S. (Oregon) 1927, M.A. (Columbia) 1930
Professor of Physical Education

HODGES, JOHN ELTON
B.B.A. (Texas) 1935, M.B.A. (Texas) 1937
Associate Professor of Economics

HODGES, LEE
S.B. (Harvard) 1930, M.A. (Rice) 1934
Instructor in French and Spanish
THE RICE INSTITUTE

HOUSTON, WILLIAM VERMILLION
B.A., B.S. in Ed. (Ohio State) 1920, S.M. (Chicago) 1922, Ph.D. (Ohio State) 1925, D.Sc. (Ohio State) 1950
Professor of Physics and President of the Rice Institute

HUDSON, BRADFORD BENEDICT
A.B. (Stanford) 1930, Ph.D. (California) 1947
Associate Professor of Psychology

HUDSPETH, C. M.
B.A. (Rice) 1940, LL.B. (Texas) 1946
Lecturer in Government

JITKOFF, ANDREW N.
Bachelor (Prague Inst. of Tech.) 1928, Master (Prague Inst. of Tech.) 1931
Lecturer in Russian

JORDAN, FLOSSIE E.
B.S. in M.E. (Purdue) 1948, M.S. in Psych. (Illinois Tech.) 1950
Instructor in Engineering Drawing

KILPATRICK, JOHN EDGAR
B.A. (Stephen F. Austin) 1940, A.M. (Kansas) 1942, Ph.D. (California) 1945
Associate Professor of Chemistry

KNIGHTLEY, WILLIAM JOHN, JR.
A.B. (Wichita) 1946, M.A. (Wichita) 1948
Instructor in English

LEAR, FLOYD SEYWARD
Professor of History

LEIFESTE, A. A., JR.
A.B. (Southwestern) 1934, B.S. in Arch. (Rice) 1941
Assistant Professor of Architecture

LENT, ROBERT FOLSOM
B.Arch. (Cornell) 1928
Associate Professor of Architecture
LEWIS, EDWARD S.  
Assistant Professor of Chemistry

LOUIS, ANDREW  
Ph.B. (Wesleyan) 1929, Ph.D. (Cornell) 1935  
Associate Professor of German

LOVETT, EDGAR ODELL  
A.B. (Bethany) 1890, M.A., Ph.D. (Virginia) 1895, Ph.D. (Leipzig) 1896, L.L.D. (Drake, Tulane, Baylor, Bethany), Sc.D. (Colorado College)  
President Emeritus of the Rice Institute

LYLE, C. COLLIS, JR.  
B.A. (Cornell) 1933, M.A. (Cornell) 1934, Ph.D. (Iowa) 1948  
Assistant Professor of German  
(On leave of absence 1950-51)

McBRIDE, GUY T., JR.  
B.S. in Ch.E. (Texas) 1940, Sc.D. (M.I.T.) 1948  
Assistant Professor of Chemical Engineering and Associate Dean for Students

McCANN, SAMUEL GLENN  
Ph.B. (Wooster) 1914, M.A. (Rice) 1917  
Instructor in Jurisprudence and Registrar

McCANTS, JOHN THOMAS  
B.S. (Marion Inst.) 1902, B.A. (Marion Inst.) 1905, M.A. (Virginia) 1906, M.A. (Yale) 1909  
Instructor in Business Administration and Bursar

McDOUGLE, CLYDE CALVIN  
B.S. in Ph.Ed. (Rice) 1942, M.A. (Columbia) 1948  
Assistant Professor of Physical Education

MCENANY, MICHAEL VINCENT  
B.S. in E.E. (Colorado College) 1929, M.A. in Physics (Dartmouth) 1931  
Associate Professor of Electrical Engineering
Mackey, William Sturges, Jr.
B.A. (Rice) 1943, C.P.A. 1948, M.B.A. (Texas) 1950
Instructor in Business Administration

McKillop, Alan Dugald
Professor of English

MacLane, Gerald R.
B.A. (Yale) 1941, A.M. (Harvard) 1942, Ph.D. (Rice) 1946
Assistant Professor of Mathematics

MacLean, James Beattie
Instructor in German

Mandelbrojt, Szolem
B.S. (Warsaw) 1917, Docteur ès Sciences (Paris) 1923
Professor of Mathematics

Mansfield, Lester
B.A. (City College of New York) 1941, Certificat de l'École Supérieure des Professeurs de Français (Paris) 1947, Docteur d'Université (Paris) 1949
Instructor in French

Marsh, Malcolm Ray
B.S. in C.E. (Texas) 1927
Instructor in Engineering Drawing

Masterson, William Henry
Assistant Professor of History

Milligan, Winfred O.
Associate Professor of Chemistry
Moraud, Marcel
Bachelier ès Lettres (Poitiers) 1907, Licencié ès Lettres (Paris) 1908, Diplomé d'Études supérieures (Paris) 1910, Agrégé de l'Université (Paris) 1914, Docteur ès Lettres (Paris) 1933
Professor of French

Morehead, James Caddall, Jr.
A.B. (Princeton) 1935, B.Arch. (Carnegie Inst. of Tech.) 1939
Associate Professor of Architecture and Assistant to the President

Neely, Jess Claiborne
LL.B. (Vanderbilt) 1924
Director of Athletics and Head Coach of Football

Nicholas, Henry Oscar
A.B. (Oberlin) 1919, Ph.D. (Yale) 1923
Associate Professor of Chemistry

Paslay, Paul R.
B.S. in M.E. (Louisiana State) 1950
Instructor in Mechanical Engineering

Pauw, Adrian
Assistant Professor of Civil Engineering

Perkins, Cyrus Wilfred
B.A. (McMaster) 1910, M.A. (McMaster) 1911
Visiting Lecturer in German

Perry, William C.
B.A. (Rice) 1938, LL.B. (Texas) 1941
Instructor in Business Law

Pfeiffer, Paul E.
B.S. in E.E. (Rice) 1938, B.D. (Southern Methodist) 1943
Instructor in Electrical Engineering

Phillips, Edward Hake
Instructor in History and Government
PHILLIPS, GERALD CLEVELAND  
B.A. (Rice) 1944, M.A. (Rice) 1947, Ph.D. (Rice) 1949  
Instructor in Physics  
(On leave of absence 1950-51)

PITKANEN, PAUL H.  
A.B. (Carleton) 1940  
Instructor in Physics

PLUMBLEY, JOHN A.  
B.S. in Ph.Ed. (Rice) 1948  
Instructor in Physical Education

PLUNKETT, ROBERT  
Assistant Professor of Mechanical Engineering

POINDEXTER, HALLY BETH WALKER  
B.A. (Rice) 1947, B.S. (Univ. of Houston) 1949  
Instructor in Physical Education

READER, WILLIAM WHITNEY  
B.A. (Rice) 1932, C.P.A. (Texas) 1943  
Visiting Lecturer in Taxation

RICHTER, GEORGE HOLMES  
B.A. (Rice) 1926, M.A. (Rice) 1927, Ph.D. (Rice) 1929  
Professor of Chemistry and Dean

RISSE, J. R.  
A.B. (Franklin and Marshall) 1931, M.A. (Princeton) 1935,  
Ph.D. (Princeton) 1938  
Associate Professor of Physics

RYON, LEWIS BABCOCK  
C.E. (Lehigh) 1917  
Professor of Civil Engineering

SHARP, W. L.  
A.B. (Chicago) 1947, A.M. (Chicago) 1949  
Instructor in English
INSTRUCTIONAL STAFF

SHELTON, Fred Vernon
B.A. (Rice) 1926, M.A. (Rice) 1928, M.A. (Univ. Nac. de Mexico) 1942
Associate Professor of French

SIMONS, Verne Franklin
A.B. (Kansas) 1923, A.M. (Kansas) 1925, C.P.A. 1931
Associate Professor of Economics and Assistant Bursar

SIMS, James Redding
B.S. in C.E. (Rice) 1941
Assistant Professor of Civil Engineering
(On leave of absence 1950-51)

SLAUGHTER, John Willis
A.B., B.D. (Lombard) 1898, Ph.D. (Michigan) 1901
Lecturer Emeritus in Civics and Philanthropy

SMITH, John Treanor
B.S. in Ch.E. (Rice) 1940, M.S. (Michigan) 1941, Ph.D. (Michigan) 1943
Assistant Professor of Chemistry

SQUIRE, Charles Francis
Ph.D. (Johns Hopkins) 1937
Professor of Physics

TALMAGE, Roy V.
A.B. (Maryville College) 1938, M.A. (Richmond) 1940, Ph.D. (Harvard) 1947
Associate Professor of Biology

THIBODEAUX, Murphy H.
B.S. in C.E. (Rice) 1949
Instructor in Civil Engineering

THOMAS, Joseph David
Ph.B. (Chicago) 1929, A.M. (Chicago) 1930
Assistant Professor of English and Assistant Registrar
TODD, ANDERSON  
B.A. (Princeton) 1943, M.F.A. in Arch. (Princeton) 1949  
Instructor in Architecture

TSANOFF, RADOSLAV ANDREA  
B.A. (Oberlin) 1906, Ph.D. (Cornell) 1910  
Professor of Philosophy

ULRICH, FLOYD EDWARD  
Associate Professor of Mathematics

WALKER, WILLIAM DELANY, JR.  
B.A. (Rice) 1944, Ph.D. (Cornell) 1949  
Assistant Professor of Physics

WANN, TRENTON WILLIAM  
A.B. (California) 1937, Ph.D. (California) 1949  
Assistant Professor of Psychology

WASER, JÜRG  
Ph.D. (Calif. Inst. of Tech.) 1944  
Assistant Professor of Chemistry

WATERS, JAMES STEPHEN  
B.S. (Rice) 1917  
Professor of Electrical Engineering

WATKIN, WILLIAM WARD  
B.S. in Arch. (Pennsylvania) 1908  
Professor of Architecture

WEBB, DAVID AIKEN  
A.B. (South Carolina) 1939, A.B.L.S. (Emory) 1940, A.M.L.S. (Michigan) 1947  
Associate Librarian

WELSH, HUGH CLAYTON  
M.D. (Texas) 1923  
Medical Adviser and Instructor in Biology
WHITING, GEORGE WESLEY
A.B. (West Virginia) 1908, A.M. (Harvard) 1913, Ph.D. (Chicago) 1926
Professor of English

WILLIAMS, GEORGE GUION
B.A. (Rice) 1923, M.A. (Rice) 1925
Assistant Professor of English

WILSON, HAROLD ALBERT
Professor Emeritus of Physics

WISCHMEYER, CARL RIEHLE
B.S. in E.E. (Rose Polytechnic) 1937, M.Eng. in E.E. (Yale) 1939, E.E. (Rose Polytechnic) 1942
Associate Professor of Electrical Engineering

WOODBURN, JAMES
B.S. (Purdue) 1938, Dr.Eng. (Johns Hopkins) 1947
Associate Professor of Mechanical Engineering

WYATT, EDWIN MATHER
B.S. (Kansas Teachers College) 1917, M.S. (Wisconsin) 1927
Instructor in Engineering Drawing

YOUNG, HOMER HARRY
B.A. (Austin College) 1930, M.A. (Southern Methodist) 1937, Ph.D. (Texas) 1949
Assistant Professor of Education

YOUNG, JAMES DEAN
B.S. (Calif. Inst. of Tech.) 1949, A.M. (Stanford) 1950
Instructor in English

ASSISTANTS AND FELLOWS

ADAMS, CHARLES REX
B.A. (East Texas State Teachers College) 1950
Fellow in Chemistry
Aldrich, David V.
A.B. (Kenyon) 1950
Fellow in Biology

Altenburg, Luolin Storey
B.A. (Rice) 1935
A.E.C. Fellow in Biology

Baggett, Lester Marchant
B.A. (Southwestern at Memphis) 1943, M.S. (Georgia Inst. of Tech.) 1948
Dick Mayo Lykes Fellow in Physics

Bame, Samuel Jarvis, Jr.
B.Sc. in Physics (North Carolina) 1947, M.A. (Rice) 1949
Humble Fellow in Physics

Barker, J. R.
B.S. in Ph.Ed. (Rice) 1949
Assistant in Physical Education

Barrett, John Harold
B.S. (Rice) 1948, M.A. (Rice) 1950
Charles A. Coffin Fellow in Physics

Beck, Earl Reginald, Jr.
B.S. in E.E. (Rice) 1949
Fellow in Electrical Engineering

Binford, Jesse Stone, Jr.
B.A. (Rice) 1950
Fellow in Chemistry

Blake, Ruth
B.A. (Rice) 1950
Assistant in French

Boozer, Charles Eugene
B.S. (Stephen F. Austin) 1949
Fellow in Chemistry

Bott, Lawrence L.
B.S. (Illinois) 1947, M.A. (Rice) 1949
Fellow in Chemistry
Brinkman, Ernest John  
B.S. in Ch.E. (Rice) 1950  
Fellow in Chemical Engineering

Burke, William Henry, Jr.  
B.S. (Rice) 1948, M.A. (Rice) 1949  
Fellow in Physics

Burr, Jesse Herndon, Jr.  
B.A. (Rice) 1947, M.A. (Rice) 1949  
Fellow in Biology

Butler, James Wilford  
B.S. in Ch.E. (Georgia Inst. of Tech.) 1944, M.A. (Rice) 1949  
Fellow in Physics

Carrión, Vicente  
B.S. (Univ. Nac. de Mexico) 1943  
Assistant in Romance Languages

Chambless, Beauford  
B.A. (Washington Univ.) 1947, M.A. (Rice) 1949  
Assistant in History

Conner, Jerry Power  
B.A. (Rice) 1948  
A.E.C. Fellow in Physics

Cook, Charles Falk  
B.A. (Texas Christian) 1948, M.A. (Texas Christian) 1950  
Fellow in Physics

Cookенкоо, Leslie, Jr.  
B.A. (Rice) 1947  
Assistant in Economics

Dean, Alice Crowell  
B.A. (Rice) 1916, M.A. (Rice) 1919  
Librarian Emerita

Delaune, Henry Malcolm  
B.A. (Missouri) 1950  
Fellow in English
DODSON, JOSEPH JACKSON, Jr.
B.S. in C.E. (Rice) 1940
Fellow in Civil Engineering

DOUGLAS, JIM, Jr.
B.S. in C.E. (Texas) 1946, M.S. in C.E. (Texas) 1947, M.A. (Rice) 1950
Assistant in Mathematics

DRAPER, ARTHUR LINCOLN, Jr.
B.S. (Rice) 1948, M.A. (Rice) 1949
Humble Fellow in Chemistry

DULLER, NELSON MARK, Jr.
B.S. (Texas A. and M.) 1948
Fellow in Physics

DVORETZKY, ISAAC
B.A. (Rice) 1948, M.A. (Rice) 1950
Fellow in Chemistry

FAMULARO, KENDALL FERRIS
B.S. (Calif. Inst. of Tech.) 1949
Dow Fellow in Physics

FINE, RAYMOND KASEF
B.A. in Arch. (Syracuse) 1950
Fellow in Architecture

FLECK, JOSEPH AMADEUS
Fellow in Physics

FROST, ROBERT CARLTON
B.A. (Reed) 1948, M.A. (Rice) 1950
Fellow in Biology

GANT, PRESTON L.
B.S. (Baylor) 1949, M.S. (Baylor) 1950
Fellow in Chemistry
INSTRUCTIONAL STAFF

GRENIER, CLAUDE
Licences ès Sciences (Paris) 1947, Diplomé d'Études supérieures de Physique (Paris) 1948, C.A. 1949
Research Fellow in Physics

HAAR, JOHN L.
B.A. (British Columbia) 1950
Assistant in German

HAKE, EVELYN KUHN
B.A. (Rice) 1930, M.A. (Rice) 1932
Research Assistant in Biology

HAMMEL, JAY EDWIN
B.S. (Calif. Inst. of Tech.) 1944
Fellow in Physics

HENRICK, JOHN JOSEPH
B.A. (Texas Christian) 1950
Fellow in Mathematics

HEYNEMAN, DONALD
A.B. (Harvard) 1950
Fellow in Biology

JOHNSON, BURNETT HOOD
B.S. (Sam Houston) 1944
Humble Fellow in Chemistry

JONES, EUINE FAY, JR.
B.Arch. (Arkansas) 1950
Fellow in Architecture

KHOURY, ADEEB SALEEM
B.S. (Southwestern) 1949
Fellow in Chemical Engineering

KUNETKA, ROBERT E.
B.A. (Rice) 1949
Fellow in Chemistry
KWEI MAN WEI
B.S. in E.E. (National Sun Yat-sen) 1945
Fellow in Electrical Engineering

LAWFORD, DEREK VINCENT
B.A. (Cambridge) 1950
Assistant in History

LEE, GRIFF CALICUTT
B.E. in C.E. (Tulane) 1948
Assistant in Civil Engineering

LEE, RAYMOND CURTIS
B.A. (Rice) 1950
Fellow in Chemistry

LEUNG CHU YUEN
B.S. (Amoy) 1948
Fellow in Chemistry

LILLIE, ALAN B.
B.Sc. (Queen's) 1946, M.Sc. (Queen's) 1947
Dick Mayo Lykes Fellow in Physics

LINDSAY, ROBERT
Sc.B. in Physics (Brown) 1947, M.A. (Rice) 1949
Fellow in Physics

MCALEE, JAMES LEE, JR.
B.S. (Texas A. and M.) 1947, M.A. (Rice) 1949
Fellow in Chemistry

MCLEOD, ROBERT MELVIN
B.S. (Mississippi State) 1950
Fellow in Mathematics

MCWHIRTER, JACK WILSON
B.A. (Rice) 1950
Fellow in Physics

MELVIN, DOROTHY MAE
B.A. (Woman's College of U.N.C.) 1942, M.S.P.H. (North Carolina) 1945
Fellow in Biology
MERRIFIELD, PAUL E.
A.B. (Colby) 1947, M.A. (Rice) 1949
Fellow in Chemistry

MILLER, EMERY BERNLEE
B.S. (Illinois) 1947, M.A. (Rice) 1949
Fellow in Chemistry

MOROSOW, GEORGE
B.S. in M.E. (Rice) 1950
Fellow in Mechanical Engineering

PRY, ROBERT HENRY
B.S. (Texas A. and I.) 1947, M.A. (Rice) 1949
Shell Fellow in Physics

RAYMOND, THOMAS W.
A.B. (Emory) 1947, M.S. (Emory) 1948
Samuel Fain Carter Fellow in Biology

READ, KATHERINE ANNE
B.A. (Rice) 1943
Fellow in English

REITER, HANS
B.A. (Vienna) 1939, M.A. (Rice) 1950
Assistant in Mathematics

RICE, JOHN D.
B.A. (Rice) 1949
Assistant in Mathematics

RIVAS-CRESPO, JOSEFA
Licenciada in Philosophy and History (Santiago, Spain) 1945
Fellow in French

ROBERTS, LOUIS REED
B.S. (Colorado) 1949
Fellow in Chemistry

SCHMITT, ROLAND WALTER
B.A., B.S. in Phys. (Texas) 1947, M.A. (Texas) 1948
Magnolia Petroleum Fellow in Physics
SIEGEL, STANLEY ELLIOT  
B.A. (Washington and Jefferson) 1949, M.A. (Maryland) 1950  
Fellow in History

SINCLAIR, ROLF MALCOLM  
B.S. (Calif. Inst. of Tech.) 1949  
Fellow in Physics

SINGLETON, TOMMY CLARK  
B.S. (Stephen F. Austin College) 1949  
Fellow in Chemistry

SMITH, JAMES RICHARD  
A.B. (Brigham Young) 1949  
Fellow in Physics

SORRELS, JOHN DAVID  
B.S. (M.I.T.) 1950  
Fellow in Physics

STEWART, ELMO JOSEPH  
B.S. (Utah) 1937, M.S. (Utah) 1939  
Fellow in Mathematics

STRICKLER, WALTER ROY  
B.S. (S.L.I.) 1944, M.A. (Rice) 1949  
Fellow in Mathematics

SWIM, RICHARD TAYLOR  
B.A. (Rice) 1950  
Fellow in Physics

TANG SUI SHUEN  
B.S. (Chekiang) 1943  
Fellow in Mechanical Engineering

THOMPSON, LEWIS CHISHOLM  
B.A. (Rice) 1950  
Fellow in Physics

TRUITT, NORMAN ERIC, JR.  
B.S. (Illinois) 1950  
Fellow in Chemistry
VERNON, LONNIE WILLIAM
B.A. (Rice) 1948, M.A. (Rice) 1950
Humble Fellow in Chemistry

WHITFIELD, JOHN HARRY, JR.
B.S. in C.E. (Rice) 1950
Fellow in Civil Engineering

WOJECKI, EDWARD J.
B.S. (Louisiana Tech.) 1936
Assistant in Physical Education

ZASCHE, ELLEN RITA
Diplom-Dolmetscher (Heidelberg) 1949
Fellow in History
FACULTY COMMITTEES

THE PRESIDENT is a member, ex officio, of all committees.

COMMITTEE ON ADMISSIONS: Mr. McCann, chairman; Messrs. Fulton, Hudson, Ryon, Squire, Thomas, and Wischmeyer.

COMMITTEE ON GRADUATE INSTRUCTION: Mr. Houston, chairman; Messrs. Bonner, Bray, Chandler, McKillop, Richter, and Woodburn.

COMMITTEE ON EXAMINATIONS AND STANDING: Mr. Thomas, chairman; Messrs. Akers, Chandler, Dix, McEnany, and Morehead.

COMMITTEE ON SCHEDULES: Mr. McCann, chairman; Messrs. Hartsook, J. Hodges, Nicholas, Risser, and Woodburn.

COMMITTEE ON STUDENT ACTIVITIES: The Associate Dean for Students, ex officio, chairman; Messrs. Davies, Dunaway, Hermance, Louis, McBride, Morehead, and Shelton; Lieutenant Commander Thompson; the Adviser to Women; the Chairman of the Hall Committee; the Chairman of the Honor Council; the President of the Student Association; the President of the Women’s Council.

COMMITTEE ON THE LIBRARY: Mr. Tsanoff, chairman; Messrs. Dix, Heaps, Lear, Ulrich, and Woodburn.

COMMITTEE ON GROUNDS AND BUILDINGS: Mr. Ryon, chairman; Messrs. Simons, Waters, Watkin, and Woodburn.

COMMITTEE ON PUBLICATIONS: Mr. Thomas, chairman; Messrs. Bonner, Camden, Chapman, Fulton, Giles, MacLane, and Talmage.

COMMITTEE ON PUBLIC LECTURES: Mr. Chillman, chairman; Messrs. Masterson, Milligan, Moraud, and Plunkett.

COMMITTEE ON OUTDOOR SPORTS: Mr. Bray, chairman; Messrs. Hermance and Nicholas; representatives of the R Association; Messrs. John Byrd Coffee and Russel Lee Jacobe.
Navy Committee: Mr. Waters, chairman; the Professor of Naval Science; Messrs. Bourgeois, Craig, McCann, McDougle, and Ryon.

Committee on Student Health Service: Mr. Hermance, chairman; Dr. Welsh; Messrs. Chandler, McBride, McCants, and Thomas; the Adviser to Women; the Manager of the Residential Halls.

Committee on the Freshman Course: Mr. Masterson, chairman; Messrs. Brunk, Davies, Heaps, Louis, McBride, Shelton, Waser, Williams, and Wyatt.

Executive Committee: The President, ex officio, chairman; the Dean; Messrs. Hartsook, Heaps, and Lear.
EXPENSES

The opportunities for study and research offered by the Rice Institute are open without tuition both to young men and to young women. Students, of course, are expected to meet all expenses incurred in the purchase of textbooks, drafting instruments, notebooks, examination papers, and certificates and diplomas. Laboratory expenses in the experimental courses in pure and applied science are met by laboratory fees. Extra charges will be made for excessive use of material, for excessive and unusual breakage, and for other damage to equipment.

FEES

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<td>(An annual charge for student activities.)</td>
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Gymnasium fee

All students pay this fee for the use of gymnasium equipment during their undergraduate residence. The fee

\(^1\) In addition, graduating students pay for the rental of their caps, gowns, and hoods. The cost, which was $3.50 at the last commencement, varies slightly from year to year. Concerning the thesis binding fee, see page 2.
**EXPENSES**

is paid once only by a student entering as a

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Laboratory fees

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<tr>
<td>Architecture (Every student classified as an architect)</td>
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<td>Architecture 210, 310, 410, 450, or 455, if taken alone</td>
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If a student withdraws during the two weeks following the opening day of classes, all fees will be refunded. When withdrawal occurs within the third or fourth week after the opening of classes, 50 per cent of laboratory fees (only) will be refunded. No refund will be given if withdrawal is made more than four weeks after the opening of classes.

A student not in residence must pay all fees for the academic year in which he is a candidate for a degree.

No student in arrears in his bills, including obligations to loan funds, will be admitted to any of the examinations, or be given any certificate or report of academic standing.

**RESIDENTIAL ACCOMMODATIONS**

Rooms, completely furnished exclusive of linen, may be rented in the residential halls for men, twenty-five dollars of the rental being paid when the lease is signed. The amount of rental charges will be announced by the Office of the Bursar in advance of the offering of any leases. As the charge for table board will be made at actual cost, the monthly price, payable in advance, will probably vary during the year. Rooms in the halls will be let in the
order of applications received. Such applications should be addressed to the Office of the Bursar. The residential halls are governed by a student Hall Committee, under the general supervision of the Associate Dean for Students.

Accommodations for the residence of young women on the university grounds are not available at present, but there is access to rooms for rest and study, and to tennis courts, swimming, and other forms of recreation, under the supervision of Mrs. Wilfred S. Dowden, A.B. (Baylor), M.A. (Peabody), Adviser to Women. Information concerning desirable places of residence for young women students may be had from Mrs. Dowden.

HEALTH SERVICE

A Health Service located in West Hall is maintained for students. This service includes dispensary and infirmary care. The school physician makes scheduled sick calls and can be called in case of an emergency. A registered nurse is on duty during school hours; a qualified attendant is available at all hours. Information about the facilities and care, and about insurance,¹ can be secured at the Office of the Health Service (reached by the east entrance of West Hall).

¹A Simplex Hospitalization and Accident Insurance policy with a nationally known company is available for students who desire this coverage.
STIPENDS AND FUNDS

FELLOWSHIPS

Provision is made for a variety of fellowships available to graduates of this and other institutions. There are several memorial fellowships that have been founded and endowed by gift or bequest on the part of friends of the Rice Institute. These provide a stipend designed to enable the holder to devote his time to study and research in his chosen field. There are also several industrial fellowships maintained by companies interested in the development of technical fields and the training of competent scientists and engineers.

Persons desiring to be considered for appointment as fellows should consult with the department in which they desire to work and should make application to the Registrar as early as possible.

THE WALTER B. SHARP MEMORIAL FUND FOR RESEARCH IN PURE AND APPLIED SCIENCE

In memory of her husband, Walter B. Sharp, one of the earliest and most successful of the pioneers in the development of the petroleum industry in this country, Mrs. Estelle B. Sharp, of Houston, has endowed at the Rice Institute the Walter B. Sharp Memorial Fund for Research in Pure and Applied Science. The income from this fund is to be used for the maintenance of resident or traveling fellowships in scientific research, preference to be given to geological research, with special reference to petroleum and allied products. A requisite for eligibility to these fellowships is the degree of Doctor of Philosophy, or similar standing in this or other institutions. The awards are to be known as the Walter B. Sharp Fellowships, and the holders thereof as the Walter B. Sharp Fellows of the Rice Institute. The first Walter B. Sharp Fellow was appointed for the academic year 1931-32.

THE SAMUEL FAIN CARTER FELLOWSHIP

The late Mrs. Carrie B. Carter established at the Rice Institute in 1932 the Samuel Fain Carter Fellowship in memory of her hus-
band, one of the first promoters of the lumber industry in Texas and the founder of the Second National Bank of Houston. In accordance with the terms of the gift, the endowment of $20,000 is administered in trust by the Second National Bank. The annual income of this trust fund is to be awarded to a graduate student of the Rice Institute, or a white graduate of an approved institution of learning, for the purpose of enabling the student to continue in postgraduate work, preferably at the Rice Institute; and, when the appropriate graduate schools shall have been organized, precedence is to be given to candidates in banking, business administration, and forestry. In the meantime, the award is to be made for the prosecution of postgraduate work in history and allied subjects, in science or engineering, or in other branches of liberal and technical learning for which facilities for advanced work may be available at the Rice Institute. Should a graduate of any institution other than the Rice Institute receive the award, then the postgraduate work shall be done only at the Rice Institute. The holder is to be known as the Samuel Fain Carter Fellow of the Rice Institute. The award is to be made by the faculty, on the basis of highest standing in scholarship, with consideration of financial circumstances, personality, and physical fitness. The first Samuel Fain Carter Fellow was appointed for the academic year 1933-34.

THE ORA N. ARNOLD FELLOWSHIP FUND

The will of Mrs. Ora Nixon Arnold created in 1936 a fund of which the interest is available to finance traveling fellowships. Either graduates of the Rice Institute, of outstanding ability and character, or graduates of the University of Mexico, of equal distinction, may be appointed. An incumbent from Rice may study in Mexico, the South American states, the West Indies, or the Philippine Islands; an incumbent from the University of Mexico is expected to study at the Rice Institute.

THE TRAVELING FELLOWSHIP IN ARCHITECTURE

Provision for a Rice Institute Traveling Fellowship in Architecture has been made by the Alumni of the Department of Architecture and the Architectural Society of the Rice Institute, who have pledged themselves to raise funds to be given each year to a
student in architecture for the purposes of foreign and domestic travel and study. The selection of the holder of the Traveling Fellowship is to be made annually by the faculty by means of a formal competition, in which students or graduates of the Rice Institute are eligible to participate.

THE JAMES A. BAKER AND ALICE GRAHAM BAKER BEQUEST

By the last will and testament of Captain James A. Baker, for more than fifty years Chairman of the Board of Trustees of the Institute, the trustees received a fund in excess of $60,000 to be known as the James A. Baker and Alice Graham Baker Bequest. The fund is to be kept invested by the trustees and the income thereof "used in part, by the Institute, in establishing scholarships and fellowships, and to pay in whole or in part the salaries of its professors, teachers and lecturers, and in the payment of annual prizes to the students to stimulate their interest in their work."

THE CATHARINE WITHERS ROPER AND BENJAMIN E. ROPER MEMORIAL FUND

Miss Mary Withers Roper bequeathed to the Rice Institute the residue of her estate in a sum in excess of $11,000 as a memorial to her mother and father, Catharine Withers Roper and Benjamin E. Roper, pioneering contemporaries of the founder of this institution. Only the income of this fund may be expended; the principal thereof is to be kept intact in the permanent endowment fund of the Institute. Miss Roper passed away at the advanced age of eighty-four years. She began teaching very early in life, and at the time of her retirement she had spent an active life of sixty years in teaching in the schools of this vicinity.

THE EASTMAN KODAK COMPANY FELLOWSHIP

The Eastman Kodak Company maintains on a year-to-year basis a fellowship for predoctoral study in physical chemistry. The present amount of the stipend is $1200.

THE DOW CHEMICAL COMPANY FELLOWSHIPS

On the initiative of Dr. Willard H. Dow, President of the Dow Chemical Company, a scholarship or fellowship was established by the Company in September, 1943, on a year-to-year basis, to
be awarded to a Rice student in chemistry, chemical engineering, or physics. A Senior student receiving the award will be the Dow Chemical Company Scholar; a graduate student receiving this award will be the Dow Chemical Company Fellow. The present amount of the stipend is $750. The Dow Chemical Company has also provided a fellowship in the amount of $1500 to be awarded to a graduate student of mechanical engineering.

THE HUMBLE OIL AND REFINING COMPANY FELLOWSHIPS

In September, 1945, the Humble Oil and Refining Company established at the Rice Institute two fellowships for X-ray diffraction research. The amount of the stipend will be based in each case on the previous training of the fellow. Effective in September, 1947, the Humble Company also established one fellowship in chemistry and one in physics carrying stipends of $1250. No limitation is placed on the nature of the research carried on by these two fellows.

THE MAGNOLIA PETROLEUM COMPANY FELLOWSHIP

The Magnolia Petroleum Company has established at the Rice Institute a fellowship for research work in the general field of physics of the liquid and solid state. This fellowship carries a stipend of $1500 per year, and is awarded to a graduate student who has completed one or more years of graduate work in physics.

THE PROCTER AND GAMBLE FELLOWSHIP IN CHEMISTRY

The Procter and Gamble Company has established a fellowship in chemistry, the stipend of which will be based on the previous training of the fellow.

THE SHELL FELLOWSHIP IN PHYSICS

The Shell Fellowship Committee has established at the Rice Institute a Shell Fellowship in Physics. The stipend of this fellowship is $1200 and its award is subject to the final approval of the Shell Fellowship Committee.

THE PAN AMERICAN FELLOWSHIP IN CHEMICAL ENGINEERING

The Pan American Refining Corporation has established at the Rice Institute a Pan American Fellowship in Chemical Engineer-
The stipend of this fellowship is $1250 and its award is subject to the approval of the Pan American Refining Corporation.

THE DICK MAYO LYKES MEMORIAL FELLOWSHIPS

Mr. James M. Lykes, Jr., has established two fellowships of $750 annually in memory of his brother, Dick Mayo Lykes. The fellowships are designed to assist graduate students doing research in nuclear physics. The first award was made for the academic year 1949–50.

NON-INSTITUTIONAL FELLOWSHIPS

In addition to the above fellowships, students may pursue advanced research through the Atomic Energy Commission Fellowships awarded under the National Research Council.

The Committee on Graduate Instruction processes applications for fellowships submitted by graduate students of the Rice Institute for research in other institutions and in other countries. Among available fellowships of this nature are the Rotary International Fellowship, the Rhodes Scholarships, the Charles A. Coffin and Gerard Swope Fellowships awarded by the General Electric Educational Fund, and the Frank B. Jewett Fellowships awarded by the Bell Telephone Laboratories. Applicants for predoctoral fellowships under the Fulbright Act administered by the Institute of International Education, and for postdoctoral research and teaching exchanges under the same act administered by the Committee on International Exchange of Persons, should also file with the Committee on Graduate Instruction.

Rice is one of the sponsoring universities of the Oak Ridge Institute of Nuclear Studies. The Oak Ridge Institute provides a number of fellowships to doctoral candidates who have completed their residence requirements and who want to work on a thesis problem at Oak Ridge because of the special facilities which are available.

THE RALPH BUDD AWARD

Through the generosity of Mr. Ralph Budd, former President of the Burlington Lines, a prize in the form of a medal is available for the best thesis in engineering submitted each year.
THE H. A. WILSON MEMORIAL AWARD

A substantial prize is being provided for the best research in physics done by a graduate student each year. The funds are being contributed by former graduate students of Professor Emeritus H. A. Wilson, who retired as head of the physics department in 1947.

GRADUATE ASSISTANTSHIPS

Graduate students with high academic records and outstanding qualifications may be awarded graduate assistantships in the various departments of the Rice Institute. The minimum stipend of a graduate assistantship is $800 with exemption from all fees. A student holding a graduate assistantship must be a candidate for an advanced degree; he will be expected to devote a substantial part of his program to study and research, and at the same time to teach one section in an elementary course or to do an equivalent amount of other departmental work. He will thus get a certain amount of valuable practical training in preparation for an academic career. Appointments carrying larger stipends, with a schedule equivalent to a teaching load of two sections, are occasionally available; such appointments depend on the interests and attainments of the student and on the requirements of the department.

GRADUATE SCHOLARSHIPS

Students whose previous records show marked promise but for whom no graduate assistantships are available may, especially in their first year of graduate study at the Rice Institute, be awarded graduate scholarships with exemption from all fees but without stipend. Graduate scholars may carry a full schedule of graduate work, and are not required to render any service to the Institute.
GRADUATE WORK IN MATHEMATICS

Professors: H. E. Bray, S. Mandelbrojt
Associate Professor: F. E. Ulrich
Assistant Professors: H. D. Brunk, G. R. MacLane
Lecturer: S. Agmon
Visiting Lecturer: T. Bang

The Rice Institute has always placed great emphasis on the study of mathematics, and has acquired a very complete mathematical library including all the important mathematical journals.

Admission to graduate study in mathematics will be granted to a limited number of students who have earned the bachelor's degree from the Rice Institute, or another institution of similar standing, and whose undergraduate work in mathematics is such as to indicate the ability for advanced and original work. Those students who have completed a large amount of undergraduate mathematics and who devote full time to graduate study may earn the degree of Master of Arts in one year. The minimum time required by candidates for the degree of Doctor of Philosophy is three years. It is to be expected that most students will require longer than the minimum time, particularly holders of graduate assistantships.

For the master's degree, the requirements are:

(a) The completion with high standing of at least three advanced courses.
(b) The presentation of a written thesis on a subject approved by the department.
(c) The passing of an examination in either French or German demonstrating ability to read scientific literature in the language.
(d) The passing of an oral examination given by the faculty.
For the doctor's degree, the requirements are:

(a) The completion with high standing of at least six advanced courses.

(b) The presentation of a written thesis on a subject approved by the department. The purpose of the doctor's thesis is to demonstrate the candidate's ability to make an original contribution to a field of mathematics in which he has become expert. This is a more extensive and advanced type of study than that required for the master's degree, and is expected to reveal definite originality and inventiveness, and to be suitable for publication.

(c) The writing of a minor thesis. This is a study of an assigned topic in a field outside that of the candidate's principal thesis. The time allowed for writing the minor thesis is one month.

(d) The passing of examinations in both French and German demonstrating ability to read scientific literature in these languages.

(e) The passing of an oral examination given by the faculty.

In order that they may obtain adequate experience in collegiate teaching, students holding assistantships are assigned a moderate schedule of regular teaching duties in the department. These duties usually consist of the instruction of one or two small sections in courses of elementary or intermediate character, and constitute an important part of the training for a teaching career.

**Courses in Mathematics**

Among courses which have been offered in recent years, and which may be offered in more or less modified form from time to time in the very near future, are the following:

**Mathematics 310. Advanced Calculus and Differential Equations.** This course is primarily for undergraduates, especially Juniors who have considerable facility in mathematical reasoning. It may be taken by graduate students of other departments. Three lectures per week.

*Staff*
Mathematics 400. *Theory of Functions of a Complex Variable.* This course is fundamental in analysis. Besides giving an introduction to basic concepts of analysis, it includes the study of analytic functions of a complex variable, the Cauchy-Riemann equations, Cauchy’s Integral Theorem, Taylor’s series, calculus of residues, and conformal mapping. Three lectures per week.

*Mr. Ulrich*

Mathematics 410. *Differential Equations and Introduction to the Calculus of Variations.* Three lectures per week.

*Mr. MacLane or Mr. Ulrich*


Mathematics 430. *Introduction to Modern Geometry.* Synthetic and algebraic geometry. The group of projective transformations and certain subgroups of the group of projective transformations. The geometries defined by these groups. Projective correspondences. Projective theory of conics. Three lectures per week.


Mathematics 500a. *Theory of Functions of a Complex Variable.* Normal families of functions; theorems of Montel; theorems of Stieltjes and Vitali; theorems of Picard, Schottky, Landau, and Carathéodory; theorems of Julia and Ostrowski. Three lectures per week during the first half-year.

*Mr. Mandelbrojt*

Mathematics 500b. *Theory of Functions of a Complex Variable.* Theory of the distribution of values. Three lectures per week during the second half-year.

*Mr. Ulrich*
Mathematics 501. *Theory of Functions of a Complex Variable.* A study of special analytic functions of importance in mathematical physics. The course is usually given as a seminar. Three hours of lecture per week.

*Mr. Ulrich*

Mathematics 502a. *Topological Groups.* Three lectures per week during the first half-year.


*Mr. Bray*


*Mr. Brunk*


*Mr. Bray or Mr. Brunk*


*Mr. Ulrich*

Mathematics 535a. *Fourier Transforms in the Complex Domain.* Properties of the class of Fourier transforms of functions of class \(L\). Properties of the solution of the integral equation of convolution type with special reference to the Fourier transforms of the kernel, together with a study of the complex transform of the solutions. General Tauberian theorems. The Paley-Wiener the-
orem. Applications. Three lectures per week during the first half-year.

Mr. Mandelbrojt

Mathematics 535b. Analytic Continuation and Infinitely Differentiable Functions. Topics selected from the following: regularization of sequences, problem of equivalence of classes, quasi-analyticity, Watson's problem, applications to Fourier series, singularities of Taylor series, relationship between singularities of Taylor series and quasi-analyticity. The course will be based on a general theory of asymptotic series. Three lectures per week during the second half-year.

Mathematics 536a. Theory of Composition. Properties of functions defined by composition of convolution type in relation to the component functions. Applications to the study of functions defined by Taylor series and Dirichlet series. Applications to asymptotic series and quasi-analyticity. Three lectures per week during the first half-year.

Mr. Mandelbrojt


Mathematics 545b. Hydrodynamics. Selected topics in the theory of incompressible fluid motion. Introduction to the problems of compressible flow. Three lectures per week during the first half-year.

Mathematics 550. Advanced Theory of Riemann Surfaces: topo-
logical properties, theory of entire and meromorphic functions, problem of type. Three lectures per week.

Mr. Ulrich

Mathematics 551a. Conformal Mapping. The fundamental mapping theorem. Correspondence between boundary elements. Three lectures per week during the first half-year.


Mr. Mandelbrojt


Mathematical Colloquium. The colloquium usually meets one afternoon every other week in order to allow the exposition of original investigations by its members.

Besides the courses listed above, others will be given from time to time to fit the needs of students. Reading courses are also offered in other fields of analysis in connection with research.
GRADUATE WORK IN PHYSICS

Professor Emeritus: H. A. Wilson
Professors: T. W. Bonner, C. W. Heaps, W. V. Houston, C. F. Squire
Associate Professor: J. R. Risser
Assistant Professor: W. D. Walker
Instructors: G. C. Phillips, P. H. Pitkanen

A minimum of one year of graduate study is required for the degree of Master of Arts and at least two more years for the degree of Doctor of Philosophy.¹ To be recommended for the degree of Doctor of Philosophy, a student must present an original thesis describing the results of his experimental or theoretical research in form suitable for publication. He must also attend a sufficient number of courses to acquire a broad fundamental knowledge of physics in addition to his research specialization. His mastery in the field of physics will be tested by an oral examination given by the faculty.

The research done in the department has included work on the following subjects among others:

1. Nuclear disintegrations produced by high-energy protons and deuterons.
2. Energies of β and γ rays.
3. Scattering of neutrons and disintegrations produced by neutrons.
5. Cosmic rays.
6. Variation of e/m for electrons with velocity.
7. Hall effect in metals and gases.
8. Magnetic properties of iron and other materials.
11. Superconductivity.

¹ Concerning language requirements for each degree, see page 2.

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The physics laboratories contain twenty rooms suitable for research, several of which are large enough for more than one man to work in. There is a well-equipped workshop in which four instrument makers are employed, and another workshop for graduate students. One of the instrument makers is a skilled glass blower.

Ten of the research rooms are air-conditioned and can be kept at nearly constant temperature.

The research equipment includes a high-pressure Van de Graaff generator, giving over two million volts, and a Cockcroft and Walton voltage doubler, giving two hundred thousand volts, for work on nuclear reactions. The Van de Graaff machine is in a separate air-conditioned building. Auxiliary equipment includes cloud expansion chambers, Geiger counters, proportional counters, linear amplifiers, a gamma-ray spectrograph, scaling circuits, electrosopes, and radioactive sources. Recently an annular magnet with poles of 75 cm. diameter has been completed for precision measurements of energies of charged particles.

For research in low-temperature physics a modern liquid helium plant is available which supplies several liters of liquid helium an hour. Auxiliary equipment is being used for low-temperature specific heat measurements, for magnetic studies on superconductors, and for superfluidity studies on liquid helium.

The department has a large electromagnet, the current for which is supplied by a 25 kw. generator, and a large cobalt steel permanent magnet with poles 15 cms. in diameter.

The research rooms are supplied with three-phase A.C. at 110 and 220 volts, and with D.C. from two batteries, one of 300 ampere hours capacity, giving up to 120 volts, and also from two 10 kw. D.C. generators. Gas, water, and compressed air are also available.

Cathode-ray oscillographs, oscillators, amplifiers, power supplies, and klystrons and magnetrons are available for research on electronics and highfrequency electromagnetic waves.

The optical equipment includes a large Michelson echelon and
several interferometers, a large quartz spectrograph, a spectrophotometer, an infrared spectrometer, an ultraviolet spectrometer, and several wave-length spectrometers. There are several darkrooms in the laboratory. Equipment for work on X-rays is also available.

A sound-level meter, a sound analyzer, and quartz plate oscillators are available for work on sound and supersonics.

The library is especially well equipped with a very complete file of periodicals.

Courses in Physics

All courses in the department extend throughout both semesters.

Physics 400. Introduction to Mathematical Physics. A systematic review of the principal subjects in mechanics and electrodynamics. Mathematical methods, including differential equations and vector analysis, will be applied to the solution of problems in particle dynamics, vibrating systems, dynamics of rigid bodies, electrostatics, magnetostatics, and the electromagnetic field. Three class hours and two problem hours per week.

Mr. Houston


Three lectures and three hours of laboratory per week.

Mr. Squire

and Einstein-Bose statistics. Application to microscopic properties of matter. Three lectures per week.

Mr. Squire

Physics 500. Electron Theory. Conduction of electricity in gases, including ionization and recombination, motion of ions in electric and magnetic fields, the glow discharge, the arc, and the spark. Conduction of electricity in metals and semi-conductors. The dielectric constant. Dispersion. Optical properties of metals. Theories of magnetism and of galvanomagnetic phenomena. Three lectures per week.

Mr. Heaps

Physics 510. Advanced Dynamics. The general equations of analytical dynamics with emphasis on the method of Hamilton. Dynamics of a particle; rigid bodies; rotation; principles of least action; three-body problem; orbits. Three lectures per week.

Mr. Heaps

Physics 520. Principles of Quantum Mechanics. A deductive presentation of the principles of quantum mechanics with applications to various problems in spectroscopy, collisions of atomic particles, molecular binding, etc. Three lectures per week.

Mr. Houston


Mr. Risser

Physics 540. Nuclear Physics. Radioactivity; alpha, beta, and gamma radiations and their interaction with matter; properties of nuclei; theory of nuclear structure; nuclear magnetic moments and spins; beta disintegrations; artificial disintegration of nuclei; nuclear scattering; fission; cosmic rays. Three lectures per week.

Mr. Bonner

Physics 550. Special and General Theories of Relativity. Two lectures per week.

Mr. Wilson

*Mr. Houston*


*Mr. Squire*

Physics 580. *Physics Colloquium*. One meeting a week at which results of researches in physics will be discussed.


Physics 600. *Special Topics in Solid State Physics*. Two lectures per week.

*Messrs. Houston and Squire*

Physics 610. *Neutron and Reactor Physics*. Two lectures per week.

*Mr. Risser*


*Mr. Walker*

Physics 700. *Summer Graduate Research*. Open only to students already admitted as candidates for an advanced degree. At least forty hours of laboratory work per week.
A student who has completed a course for the degree of Bachelor of Arts may be admitted as a candidate for the degree of Master of Arts or of Doctor of Philosophy.

Preparation for the degree of Doctor of Philosophy involves at least three years of graduate work. The thesis must present a distinctly original contribution to the subject. It should be acceptable for publication in an accredited journal or series, and copies must be deposited in the Institute library.

The following specific requirements must be met by candidates for advanced degrees taking their major work in chemistry:

(a) For admission to graduate standing, candidates for advanced degrees must possess a reading knowledge of scientific German; and must have completed general courses equivalent to the work through organic and physical chemistry offered during the first three years of an undergraduate major in chemistry at the Rice Institute, and at least one full-year course of more advanced study equivalent to Senior work in chemistry of the Rice Institute.

(b) For admission to graduate standing in chemistry, preference will be given to applicants who earn high scores on the Graduate Record Examination, including the advanced test in chemistry. (See page 3.) A new graduate student who has not taken the Graduate Record Examination may be required to do so at the earliest examination time during his first semester of residence.

(c) A candidate for the degree of Master of Arts is required
to complete, in addition to a thesis, three approved full-year courses; and, also, he must pass a final public oral examination.

(d) During the first two weeks of each academic year, comprehensive written examinations in physical, inorganic, and organic chemistry will be given to all graduate students beginning their second year of work. The results of these examinations will determine whether the student will be permitted to continue in graduate work beyond the master's degree.

(e) A candidate for the degree of Doctor of Philosophy must have met the course requirements for the master's degree in chemistry; in addition he must complete three advanced full-year courses approved by the department, together with the doctoral thesis. He must satisfy the Institute language requirements (see page 2) by demonstrating a reading knowledge of scientific French and scientific German. Also, he must pass a final public oral examination.

Graduate assistants who devote as much as six hours per week to teaching will, in general, be expected to spend two years in residence for the master's degree and four years in residence for the doctor's degree.

Courses in Chemistry

Chemistry 400a. Advanced Organic Chemistry. Three lectures and two laboratory periods weekly during the first half-year. A course in the newer methods of organic synthesis.

Mr. Lewis

Chemistry 410a. Colloid Chemistry. Three lectures and four hours of laboratory work weekly during the first half-year. An introductory course dealing with the theories of colloid chemistry and their applications. Prerequisites: Organic Chemistry and Physical Chemistry.

Mr. Milligan


Mr. Milligan
Chemistry 430a. *Special Topics in Physical Chemistry*. Three lectures weekly during the first half-year. The course is designed to give a more thorough treatment to selected phases of the subjects introduced in Physical Chemistry.

*Mr. Smith*

Chemistry 440b. *Advanced Organic Chemistry and Qualitative Analysis*. Two lectures and six hours of laboratory work weekly during the second half-year. This course embodies a systematic procedure for the separation and identification of pure organic compounds. It aims to review, by actual laboratory contact, the important reactions of the main series of organic substances. (Owing to limitations of space, enrollment will be limited to thirty-five students.)

*Mr. Lewis*

Chemistry 450a. *Thermodynamics*. Three lectures weekly during the first half-year. Relation of heat and work to chemical and physical systems. A consideration of free energy, entropy, and fugacity as applied to equilibria. Special attention to the treatment of solutions.

*Mr. Kilpatrick*

Chemistry 460b. *Inorganic Chemistry*. Three lectures weekly during the second half-year. A study of selected topics in inorganic chemistry presented from the physical chemical viewpoint.

*Mr. Smith*

Chemical Engineering 405. *Unit Operations*. Three lectures weekly. This course deals with the principles upon which the mechanical operations involved in the chemical manufacturing industries depend, and with the types of equipment available for such operations and the kind of work for which each is best adapted. The application of the principles is illustrated both by discussion in the classroom and by the solution of typical problems. Among the subjects considered are: evaporation, humidification and dehumidification, air conditioning, drying, distillation and fractionation, filtration, absorption and adsorption, extraction, crystallization, crushing, grinding, separation, agitation, transpor-
tation of solids, liquids, and gases, etc. Prerequisite: Junior chemical engineering.

Mr. Hartsook

Chemistry 500. M.A. Thesis. Graduate students who are working toward the M.A. degree in chemistry are expected to elect at least nine hours a week in research under the direction of some member of the staff of instruction.


Mr. Milligan

Chemistry 530b. Heterogeneous Equilibrium. Two lectures weekly during the second half-year. A study of the problems of heterogeneous equilibrium from the standpoint of the phase rule.

Mr. Smith

Chemistry 540a. Advanced Organic Chemistry. Two lectures weekly during the first half-year. A consideration of some of the theoretical aspects of organic chemistry with particular reference to such topics as geometrical and optical isomerism.

Mr. Richter

Chemistry 545. Physical-organic Chemistry. Three lectures weekly. A study of the structure of organic compounds and the mechanism of organic reactions, including the application of the methods of physical chemistry to these problems.

Mr. Lewis

Chemistry 550a. Reaction Kinetics. Three lectures weekly during the first half-year. A consideration of the rates of reactions with emphasis on the homogeneous kinetics as a tool in the study of reaction mechanisms.

Mr. Lewis

Chemistry 560b. Electrochemistry. Three lectures weekly during the second half-year. The application of thermodynamics to the study of electrolytic cells. Prerequisite: Chemistry 450a.

Mr. Kilpatrick
Chemical Engineering 505a. Chemical Engineering Thermodynamics. Three lectures weekly during the first half-year. A course in theoretical and applied thermodynamics. Prerequisite: Physical Chemistry.

Mr. Akers

Chemical Engineering 510b. Chemical Engineering Thermodynamics. Three lectures weekly during the second half-year. A continuation of theoretical and applied thermodynamics. Prerequisite: Chemical Engineering 505a.

Mr. Garrison

Chemical Engineering 555a. Chemical Reaction Kinetics. (See page 76.)

Chemical Engineering 565a. Advanced Topics in Chemical Engineering. (See page 76.)

Chemical Engineering 575a. Physical Equilibrium in Fluid Systems. (See page 77.)

Chemistry 600. Ph.D. Thesis. Graduate students who are working toward the Ph.D. degree in chemistry are expected to elect at least twelve hours a week in research under the direction of some member of the staff of instruction.


Mr. Milligan


Mr. Waser

Chemistry 630b. Statistical Thermodynamics. Three lectures
weekly during the second half-year. A development of the principles of thermodynamics from the standpoint of statistical mechanics. The relation of the structure of molecules to their thermodynamic properties. Prerequisites: Chemistry 450a, and Advanced Calculus and Differential Equations.

Mr. Kilpatrick

Chemistry 640. Heterocyclic Chemistry. Two lectures weekly. A consideration of the chemistry of heterocyclic systems.

Mr. Richter

Chemistry 650. Quantum Mechanics. Three lectures weekly. A study of simple mechanical systems from the point of view of wave mechanics. The application of these concepts to the chemical bond. The energy states of polyatomic molecules. Prerequisite: Advanced Calculus and Differential Equations.

Mr. Kilpatrick


Mr. Waser

Chemistry 700. Summer Graduate Research. Open only to students already admitted as candidates for an advanced degree. At least forty hours of laboratory work per week.
Graduate work in biology is offered in the special fields of interest of the faculty members, including parasitology, medical entomology, some phases of protozoology and bacteriology, immunology, genetics, general physiology, radiobiology, and endocrinology.

The department is well equipped with the usual apparatus and supplies for work in general biology, physiology, bacteriology, microscopic technique, and radiobiology. Included are Warburg apparatus, Beckman pH meters, controlled drying ovens, incubators with constant temperature and humidity, centrifuges, phase contrast microscope, flame photometer, chainmatic balance, dental X-ray machine, well-equipped photographic room, constant-temperature room, animal rooms, chemical rooms for synthesis or analysis of radioactive compounds, and radiation counter room equipped with two autoscalers and a nucleometer. Small individual research rooms are provided for graduate students engaged in experimental research. Special apparatus or material can be obtained, within reasonable limits, when needed for particular problems. The library is well supplied with books and periodicals in the subjects mentioned above, and will make efforts to obtain additional material that may be needed in connection with research problems under investigation.

The biology department is a comprehensive one, embracing general biology, zoology, physiology, embryology, genetics, parasitology, bacteriology, immunology, and radiobiology. No botany is offered except a little that is given in the beginning course in General Biology. It has been the policy of the Rice Institute to try to do a few things well, rather than to spread its efforts too thinly over too many fields of interest. Some of the upper-class courses are given in alternate years in order to give the students a wider range of subjects.
Each graduate student at the end of his first year in the department is given a comprehensive examination in biology to determine the adequacy of his background for the work he plans to undertake. Every candidate for a degree must pass a public oral examination on his thesis and related subjects. A reading knowledge of French or German, as shown by an examination, is expected at the end of the first year of work for a master's degree, and of both languages in the first year of work for a doctor's degree. In exceptional circumstances, and by special agreement, another language may be substituted for French.

The master's degree is not given for advanced course work in some phase of biology as a preparation for teaching, as it is in some institutions, but is a research degree requiring a thesis embodying the results of original research. It may represent a step toward the doctorate but is not required. As a rule, students who are planning to continue toward the degree of Doctor of Philosophy will be given preference over those planning to take only the degree of Master of Arts. In very exceptional cases, when the undergraduate preparation has been adequate and some research or preparation has already been started in the Senior year or has been done during one or more summers prior to acceptance as a graduate student, the M.A. degree may be earned in one academic year, but it ordinarily requires two. The work consists of a minimum of two advanced courses, passed with high credit, and an original investigation, the results of which are presented as a thesis.

For the Doctor of Philosophy degree four academic years are usually required, but in some cases it may be completed in three if research has been continued through the summers. In addition to his research, a candidate must have completed, with high credit, at least five advanced courses, one of them usually in another department. The thesis must represent an original contribution which shows originality and ability, containing material acceptable for publication in a reputable scientific journal.

In addition to the graduate courses in the biological sciences listed below, special courses in a wide range of subjects are ar-
ranged for graduate students to fit their particular needs. Under the direction and supervision of members of the department, the student is given weekly assignments in library, laboratory, or field work, as the subject may require, with conferences once or twice a week to discuss the work done and to outline the work for the coming week. Such courses have been given in the past in certain phases of invertebrate zoology, ichthyology, herpetology, ornithology, genetics, physiology, etc. The courses listed below in medical entomology, helminthology, and protozoology are of this type also, but are given in regular rotation for graduate students in parasitology. Such courses are usually based on eight semester hours a year, as in the case of regularly scheduled laboratory science courses. About three hours of laboratory, library, or field work counts as the equivalent of one hour of lecture or recitation.

Candidates for advanced degrees who hold graduate assistantships will be expected to devote about eight to ten hours a week to assisting. In this work, as far as may be feasible, they are permitted to assist with different courses in different years to obtain as much teaching background as possible.

Courses in Biology

Biology 410. Genetics and Eugenics. This course is devoted to a study of heredity, with frequent references to human material. Prerequisites: General Biology and Junior standing. Three lectures and two hours of laboratory per week.

Mr. Altenburg

Biology 460. Embryology and Histology. In the first semester the development of the vertebrate type is considered. Early development and germ layer formation are compared in the frog, chick, and mammal, and the chick is studied intensively in connection with the development of the various organs, and also for the extra-embryonic membranes. Several types of placentation are also considered in connection with the later development of the mammal. In the second semester the first development of the organs, with their histological structure, is considered in detail. Throughout the course opportunity is given the student to become familiar with the paraffin and celloidin section techniques, and also with var-
ious staining techniques. Prerequisites: General Biology and Junior standing. Given in even-numbered years, beginning 1950; alternates with Biology 470. Three lectures and three hours of laboratory per week.

**Mr. Davies**

**Biology 470. General Bacteriology and Immunology.** Sterilization, preparation of media, and methods of cultivation; disinfection; nature and relationships of various types of micro-organisms; introduction to bacteriology of air, soil, water, sewage, dairy products and other foods, and important human, animal, and plant diseases; the principles of immunology and their application to preventive and curative medicine. Special emphasis on public health and hygienic aspects of the subject. Prerequisites: General Biology, General Inorganic Chemistry, and Junior standing. Given in odd-numbered years, beginning 1951; alternates with Biology 460. Three lectures and three hours of laboratory per week.

**Mr. Chandler**

**Biology 480a. Radiobiology.** An introductory study of the applications of nuclear radiations to biological problems. The lectures and laboratory attempt to acquaint the student with characteristics of nuclear emissions, problems of health physics, an introduction to radiochemistry, study of radiation effects, and the use of isotopes as biological tracers, as well as to review as far as possible pertinent work done in this field. Prerequisites: at least one year each of mathematics, physics, and chemistry; Comparative Anatomy; and General Physiology. Size of class limited by facilities. Three lectures and three hours of laboratory per week during the first half-year.

**Mr. Talmage**

**Biology 480b. Endocrinology.** A study of the function, morphology, and comparative anatomy of the glands of internal secretion. From limitations of time, only the well-recognized endocrine glands of mammals will be considered in detail. The lectures are supplemented wherever possible by demonstration. Prerequisites: Comparative Anatomy and General Physiology. Three lectures per week during the second half-year. No laboratory.

**Mr. Talmage**
Except by special permission of the instructors, courses numbered 500 and higher are open only to graduate students. The 600, 700, and 800 courses are continuations, in successive years, of the 500 courses; e.g., Research in Parasitology is numbered 596 in the first year, 696 in the second, etc. No distinction is made as to whether these courses are leading to M.A. or Ph.D. theses. In Biology 500 (Special Work) and in Biology 590–597 (research courses), the number of credit hours for lectures and laboratory work may vary for individual students.

In the other graduate courses, consisting of advanced work in various subjects, regularly scheduled lectures or assigned laboratory periods usually are not given. The instructor meets his students as often as he deems necessary per week for conferences or discussions on what has been accomplished during the preceding week, and to assign the work in library, laboratory, or field for the succeeding week. Ordinarily these regular discussion periods will occupy a minimum of one and a half to two hours once a week, but more frequent conferences may be required at the discretion of the instructor. Not all the advanced courses for graduates will be given every year; usually they will be offered in alternate years, except that Biology 560, 570, and 580 ordinarily will be given in rotation every three years. Graduate students in biology always should arrange their schedules with members of the department before registering.

**Biology 500. Special Work.** Advanced work in special fields of biology, adapted to the needs of individual graduate students. Registration permitted only with the consent of the instructor.

**Biology 510. Advanced Genetics.** Reading and conferences.

*Mr. Altenburg*

**Biology 530. Advanced Radiobiology.** Reading, conferences, and six hours of laboratory work per week.

*Mr. Talmage*

**Biology 540. Advanced Endocrinology.** Reading, conferences, and six hours of laboratory work per week.

*Mr. Talmage*
**Biology 550.** Advanced General Physiology. Reading, conferences, and six hours of laboratory work per week.

*Mr. Daugherty*

**Biology 560.** Medical Entomology. Classification, taxonomy, identification, life cycles, and control of arthropod parasites, disease vectors, and poisonous species. For students specializing in parasitology. Reading, conferences, and six hours of laboratory per week.

*Mr. Chandler*

**Biology 570.** Helminthology. Classification, taxonomy, identification, and life cycles of parasitic worms, and a study of economic importance, treatment, and control of helminthic diseases of man and animals. For students specializing in parasitology. Reading, conferences, and six hours of laboratory per week.

*Mr. Chandler*

**Biology 580.** Protozoology. Classification, taxonomy, identification, life cycles, and technical methods in the study of Protozoa, with special reference to parasitic forms. For students specializing in parasitology. Reading, conferences, and six hours of laboratory per week.

*Mr. Chandler*

**Biology 590.** Research in Genetics.

*Mr. Altenburg*

**Biology 591.** Research in Embryology.

*Mr. Davies*

**Biology 592.** Research in Histology.

*Mr. Davies*

**Biology 593.** Research in Physiology.

*Mr. Daugherty*

**Biology 594.** Research in Radiobiology.

*Mr. Talmage*

**Biology 595.** Research in Endocrinology.

*Mr. Talmage*

**Biology 596.** Research in Parasitology.

*Mr. Chandler*
Biology 597. Research in Medical Entomology.  
Mr. Chandler

Biology 599. Biology Seminar. The staff and graduate students meet once a week, for papers and discussions on special topics or on current research at the Institute or elsewhere. Each candidate for an advanced degree will be expected to attend and to give one or two papers a year.

Biology 700. Summer Graduate Research. Open only to students already admitted as candidates for an advanced degree. At least forty hours of laboratory work per week.
GRADUATE WORK IN THE HUMANITIES

ENGLISH

Subject to the approval of the Committee on Graduate Instruction and the department, qualified students may pursue graduate studies in English leading to the degrees of Master of Arts and Doctor of Philosophy.

Requirements for the Degree of Master of Arts

(a) Three advanced courses in English, passed with high grades.
(b) The passing of a reading examination in French or German (see page 2).
(c) The satisfactory completion of a thesis.
(d) The passing of an oral examination.

In some cases graduate students in English may complete the work for the master's degree in one year, but two years are usually necessary.

Requirements for the Degree of Doctor of Philosophy

Opportunities for research at the Rice Institute, including the facilities of the Fondren Library, make it possible for qualified students to do work leading to the degree of Doctor of Philosophy in various fields of English. Prospective students are urged to take the Graduate Record Examination at the earliest opportunity (see page 3), and to consult the department well in advance of registration with regard to their qualifications and to the feasibility of their plans for advanced studies in English. The awarding of the doctor's degree is not based on an accumulation of credits or on compliance with formal requirements; the candidate is expected to show a comprehensive knowledge of the field and to prove his command of the processes and results of scholarship. The following requirements are minimal:
(a) Eight advanced courses in English and approved collateral subjects, passed with high grades.

(b) The passing of a reading examination in two foreign languages, usually French and German (see page 2), this requirement to be met before the preliminary examination.

(c) The passing of a preliminary examination, both oral and written, on the general field of English studies, this requirement to be met at least a year before the submission of a thesis.

(d) The completion of a thesis which shall constitute an original contribution to knowledge, and demonstrate the candidate's power of independent work.

(e) The passing of a final oral examination on the thesis and related fields.

Courses in English

English 300. English Drama from Its Beginnings to 1642. The development of the drama will be traced from the miracle plays and the moralities through the plays of Shakespeare and his contemporaries to the closing of the theaters. Some emphasis will be placed upon the development of Shakespeare as a dramatist, and upon the indebtedness of Shakespeare to the earlier drama. Three hours per week.

Mr. Camden

English 310. Modern British and American Poetry. A survey of poetic development in Great Britain and America from 1890 to date: the revolt of the 1890's, the Irish Renaissance, the Georgians, the poetry of the two World Wars, the "new" American poetry. Three hours per week.

Mr. Williams

English 320. Modern Drama. Special study of Ibsen, Strindberg, Shaw, Barrie, Galsworthy, O'Neill, and Anderson; reading of representative recent English, American, and Continental plays; lectures upon theatrical history, acting, and dramatic tendencies. Three hours per week.

Mr. Whiting

English 330. Advanced Writing. The writing of essays, stories,
plays, and novels. Time is given also to problems of marketing manuscripts. Stories will be read and analyzed, and critical theories discussed. Frequent conferences. Three hours per week.

Mr. Williams


Mr. McKillop

English 350. Poetry and Prose of the Romantic Period. Study of the poetry from Blake to Keats; reading of selected prose from Lamb to Carlyle. Three hours per week.

Mr. Dowden

English 360. English Drama from 1660 to 1900. This course begins with the opening of the theaters after the Puritan Revolution and covers the drama of the Restoration, the eighteenth century, and the nineteenth century. Three hours per week.

Mr. Camden

English 370. Milton and His Contemporaries. Special study of Milton and some of the minor writers of the seventeenth century, including Donne, Herbert, Cowley, Bunyan, Pepys, and Dryden. Three hours per week.

Mr. Whiting

English 390. Major American Writers. A number of American books of the nineteenth and twentieth centuries are studied in relation to the background of American thought. The novel is the form to which most attention is given, and the primary emphasis is placed on literary qualities. Three hours per week.

Mr. Dix

English 400. Shakespeare. A close study of certain of the comedies, histories, and tragedies, with lectures on the interpretation of these plays in the light of the Elizabethan mind. Three hours per week.

Mr. Camden
English 420. *Victorian Literature.* Poetry, nonfictional prose, precursors of modern drama. Three hours per week.

*Mr. Whiting*

English 430. *Eighteenth Century Prose and Poetry.* Three hours per week.

*Mr. McKillop*

English 500. *Chaucer.* Extensive reading in the *Canterbury Tales* and *Troilus and Criseyde.* Three hours per week.

English 510. *Old English: “Beowulf.”* Three hours per week.

English 530. *Topics in English Literary History.* Graduate research.

**HISTORY**

Admission to graduate study in history may be granted to certain qualified students holding a bachelor's degree from the Rice Institute or other institutions of suitable standing. A record of ability in history and a capacity for advanced study are requisite. The following requirements are minimal, and in certain cases further study may be required by the department.

*Requirements for the Degree of Master of Arts*

This degree may in unusual circumstances be granted at the end of one year of academic work at the graduate level. Normally, however, two years are necessary to fulfill the requirements.

These requirements are:

(a) The completion with high standing$^1$ of four advanced courses approved by the department.

(b) The presentation of a written thesis giving evidence of research ability and approved by the department.

(c) The passing of a written translation examination in German or French, to be taken prior to the completion of the thesis.

(d) The passing of an oral examination conducted by the faculty on the student's field and related fields of history.

$^1$ Grades of II (B) or higher.
Requirements for the Degree of Doctor of Philosophy

This degree is offered only in certain fields of history, and any student seeking the degree should consult with the department either in person or by correspondence prior to the expected time of admission.

The degree is conferred solely in recognition of marked ability and high attainment. It should be clearly understood that no number of courses passed entitles a student to the degree. The comprehensive knowledge expected of the student demands not less than three years of full-time work at the graduate level, or the equivalent.

The minimum requirements are:

(a) The completion of eight advanced courses with high standing.\(^1\)

(b) The passing of written translation examinations in French and German.\(^2\) These examinations must be successfully completed before the preliminary examination and at least one year before the final examination.

(c) The passing of a preliminary examination conducted by the faculty on the student's major and related fields. This examination may be written or oral or both, at the discretion of the department, and its successful completion means that the student is accepted as a candidate for the degree. (In no case shall the oral examination for the master's degree be considered a sufficient substitute for this preliminary examination.)

(d) The presentation of a written thesis on a subject approved by the department. This thesis must be an original contribution to the field of history and must demonstrate a high degree of scholarly ability in research and expression.

(e) The passing of an oral examination conducted by the faculty on the thesis and related fields.

Courses in History and Political Science

History 300. Cultural History of the United States. This course deals with the primary trends in the social and intellectual life of

\(^1\) Grades of II (B) or higher.

\(^2\) On recommendation of the department, the Committee on Graduate Instruction may substitute other languages appropriate to the student's particular field of study.
the American people from colonial times to the present, and seeks to interpret them as expressions of the American national spirit. Prerequisite: American History. Three hours per week.

Mr. Lear

History 320. Trends in European Culture during Antiquity and the Middle Ages. This course traces selected aspects of European thought from Periclean Athens to the later Middle Ages, with special reference to Greco-Roman influences. Hellenistic, Byzantine, and Mohammedan contributions to the Latin West are considered. Religious, philosophical, and scientific implications are examined in some detail. Prerequisite: Foundations of Western Civilization. Three hours per week.

Mr. Lear

History 330. The Making of Modern Europe. A survey of European culture and politics from the decline of feudalism and the rise of the national monarchies to the French Revolution (1200–1789). The purpose of this course is to trace the development of those institutions in western Europe which have been important in the modern period. The course treats of the revival of commerce and the development of capitalism, the growth of the national monarchies, the disappearance of the medieval ideal of universality with its conception of the union of the secular and spiritual arms of government, the revival of Roman law and the expansion of the power of the state, the Renaissance and Reformation, and the first signs of social revolt. Three hours per week.

Miss Fischer

History 350. Europe Since 1789. This course emphasizes the revolutions against autocracy, the spread of democracy, the completion of nationalism, and the development of imperialism. Much attention is given to the antecedents of the world wars and revolutions of the present century, the history of this period, and the current situation in Europe. Three hours per week.

Mr. Craig

History 360. British History. A survey tracing the development of the British people, with special emphasis on the period from the beginning of the sixteenth century to the present. Imperial expansion and the evolution of those social, economic, and political forms and concepts which have basically influenced Western civilization are considered in detail. This course is recommended
to students preparing for the study of law. Three hours per week.

Mr. Craig or Mr. Lawford

History 370. Naval and Military History. The course includes a survey, from ancient times, of war as an instrument of national policy. Attention is given to the causes of wars, the principles of strategy and tactics, the personalities of great commanders, and Admiral Mahan’s doctrine of the influence of sea power upon history. Three hours per week.

Mr. Craig

History 380. Economic History of the United States. This course studies the historical development of America’s industrial economy from its earlier colonial, agricultural stage. Primary emphasis is given to the influence of noneconomic factors on economic problems and to the influence of economic factors on American history. The second semester is devoted to historical study of the economic problems of the twentieth century in America. Prerequisite: American History. Three hours per week.

Mr. E. Phillips

History 390. History of the American West. This course traces the Westward Movement from its beginnings on the east coast to its culmination on the Pacific coast. Most attention is given to the history, romance, and problems of the Trans-Mississippi West, with special emphasis on Texas and the Great Plains. Three hours per week.

Mr. E. Phillips

History 395. A History of the South. A study of the life and economy of the Southern people from the colonial period. Attention is given to such topics as the frontier, the plantation, slavery, sectionalism, and agrarian, social, and industrial problems. Primary emphasis is placed on the institutions and history of the ante-bellum period. Prerequisite: American History. Three hours per week.

Mr. Masterson

History 420. Medieval Sources. Survey and translation of typical medieval Latin sources. The selections are studied from the point of view of historical significance and of literary apprecia-
Attention is given also to the role of the Latin language in the Middle Ages, the preservation of letters in manuscripts and libraries, and the evolution of the medieval scripts. This course is intended for students of history and the modern languages who desire some familiarity with ordinary medieval Latin texts. Prerequisite: three or four years of high school Latin. Three hours per week.

Mr. Lear

History 430. Topics in Classical and Medieval Letters. This course deals with selective phases of classical and medieval literature, including satire, chronicles and histories, the romances and epic cycles, and lyric poetry. The literary sources are interpreted as historical documents. Also, intensive reading and reports on special topics in medieval literature and intellectual history. Open only to advanced students after consultation with the instructor. Three hours per week.

Mr. Lear

History 450. Contemporary History. A survey of current world affairs, with lectures and readings on the background of present-day policies and events. Three hours per week.

Mr. Craig

History 480. American Politics. An advanced survey of American political history. This course examines the patterns of American political expression from the colonial period to the 1930's. Emphasis is placed on the relationship of politics to economic and social events. Prerequisite: American History. Three hours per week.

Mr. Masterson

History 500. Topics in American History. Graduate research and thesis.

History 510. Topics in Medieval History. Graduate research and thesis.

History 520. Topics in Renaissance History. Graduate research and thesis.

History 530. Topics in Modern History. Graduate research and thesis.
History 540. *Topics in American Constitutional and Political History.* Research in the fields of American political history and constitutional development. Open to properly qualified students after consultation with the instructor.

Mr. Masterson

History 550. *Great Britain in the Napoleonic Era.* A study of the internal politics, foreign policy, and war effort of Great Britain during the Napoleonic wars, including the peace settlement of Vienna. Open to properly qualified students after consultation with the instructor. Three hours per week.

Mr. Craig

History 570. *The First World War.* A study of the causes of World War I, the course of the war itself, and the peace settlement of Versailles. Open to properly qualified students after consultation with the instructor. Three hours per week.

Mr. Craig

Political Science 310. *Law and Society.* The study of law as a part of cultural anthropology and the history of organized society. Emphasis is placed upon the sources of legal doctrine, specifically illustrated by case law and legislation in the field of contracts, torts, commercial transactions, and domestic relations. Three hours per week.

Messrs. Hudspeth and Perry

Political Science 340. *Foundations of National Power.* A study of the basic factors in political geography and international politics, stressing such elements of national power as geographical location, population, resources, technology, ideology, military strategy, and geopolitical theory. Three hours per week.

Mr. Lear

Political Science 410. *Legal History and Political Theory.* A survey of the main trends in politics and law from antiquity into early modern times, with special emphasis upon such important conceptions as god-kingship, legalized absolutism, the organic state, natural law, personality of law, custom and feudal contract,
majesty and sovereignty, allegiance, and constitutionalism. Open only to advanced students after consultation with the instructor. Three hours per week.

Mr. Lear

Political Science 520. Topics in Legal History and Political Theory. Much attention is given to methods, materials, and the recent literature in this field. Instruction is based on the translation of several primary sources in Roman and Germanic law, as well as reports on such topics as sovereignty and allegiance. Open to properly qualified students after consultation with the instructor. Three hours per week.

Mr. Lear

Political Science 540. Current Problems of United States Foreign Policy. A critical analysis of the postwar foreign policy of the United States, taking into account the shifts in the elements of power which have occurred throughout the world since the war. Three hours per week.

Mr. Craig

LANGUAGES AND PHILOSOPHY

Students who hold the degree of Bachelor of Arts and who give evidence of their qualifications to the satisfaction of the department concerned and the Committee on Graduate Instruction may be admitted to candidacy for the degree of Master of Arts in the following fields: German, philosophy, and Romance languages. These departments, while not organized for graduate work on the doctoral level, are in a position to direct well-qualified students in the earlier stages of graduate study. Library facilities in these fields are adequate for research of considerable range and variety. A minimum of one year of graduate study is required for the master's degree. A limited number of assistantships are available for students of marked promise.

German

Admission to graduate study in German may be granted to qualified holders of the bachelor's degree who have a distinguished
undergraduate record in German and are capable of independent study. Two years are normally required for the master’s degree, during which time the candidate will be expected to pursue a satisfactory course of study and assist in the instructional or administrative work of the department.

The following requirements are minimal:

(a) The completion with high standing of four advanced courses in German and two advanced courses in a related field.
(b) The completion of a thesis approved by the department.
(c) The passing of a reading examination in French.
(d) The passing of a public oral examination conducted by a committee of the faculty.

**Courses in German**

**German 410. Special Topics.** Registration by permission of the instructor. Three hours per week. Given in alternate years.

*Mr. Brookbank or Mr. Lyle*

**German 420. Goethe.** Including the study of Faust. Three hours per week. Given in alternate years.

*Mr. Brookbank or Mr. Lyle*

**German 440. German Literature from Luther to Klopstock.** Three hours per week. Given in alternate years.

*Mr. MacLean*

**German 500. Middle High German.** Three hours per week.

*Mr. Louis*

**German 550. Topics in German Literary History.** Graduate research and thesis.

*Staff*

**Philosophy**

College graduates who have shown ability in their undergraduate study of philosophy may be admitted to candidacy for the degree of Master of Arts. The beginning of advanced study presupposes the completion of four undergraduate full-year courses
in philosophy, and the fulfillment of the requirements for the degree ordinarily requires two years.

The graduate study requirements normally include:

(a) The completion with high standing of four advanced full-year courses approved by the department, one or two of which may be in allied fields.

(b) Satisfactory evidence, shown by a translation examination, of the student's ability to use French or German in his studies.

(c) The completion of a written thesis on a subject approved by the department.

(d) The passing of a satisfactory oral examination in philosophy, not limited to the student's special field of study.

Courses in Philosophy

Philosophy 300. History of Philosophy. An historical survey of the essential features and main currents of philosophical thought, ancient, medieval, and modern. Three hours per week.

Mr. Tsanoff

Philosophy 340. Philosophy of Science. The nature and development of the modern scientific view of the world. The conditions and limits of scientific knowledge; its meaning and value in man's life and thought. Three hours per week.

Mr. Fulton

Philosophy 400. Philosophy of Religion. An historical-critical study of the main problems of religion, dealing more especially with the belief in God, the idea of immortality, and the problem of evil. Three hours per week.

Mr. Tsanoff

Philosophy 420. Types of Philosophical Theory. First semester: the universal significance of Greek thought presented through reading and discussion of selected writings of Plato and Aristotle. Second semester: problems in aesthetics, and a study of the nature of creative intelligence, especially in poetry. Three hours per week.

Messrs. Fulton and Tsanoff
Philosophy 430. Modern Philosophical Classics. Three hours per week.

Mr. Tsanoff

Romance Languages

Qualified students holding a bachelor's degree from the Rice Institute, or other institutions of equal standing, may be admitted as graduate students of Romance languages, and later accepted as candidates for an advanced degree. In some cases a graduate student may complete the work for the master's degree in one year, but normally two years will be required.

The requirements for the degree of Master of Arts are:

(a) The completion of four advanced courses accepted by the department.
(b) The passing of an examination in Spanish, Italian, or German.
(c) The satisfactory completion of a thesis on a subject accepted by the department.
(d) The passing of an oral examination.

Courses in French

French 500. Main Currents in French, Italian, and Spanish Literatures. A prerequisite course for students taking a master's degree in Romance languages. Three hours per week.

French 510a. Methods of Research and Recent Research. Three hours per week during the first half-year.

French 510b. French Composition and Stylistics. Three hours per week during the second half-year.

French 520. French Classicism. Three hours per week.

French 530. The Development of French Thought in the Eighteenth Century. Three hours per week.

French 540. Franco-British Literary Relations from 1750 to 1850. Three hours per week.

French 550. The French Romantic Movement. Three hours per week. Given in alternate years.

French 580. The Contemporary French Novel. Three hours per week. Given in alternate years.

French 590. The Contemporary French Drama. Three hours per week. Given in alternate years.
GRADUATE WORK IN ENGINEERING

The Rice Institute offers graduate work in engineering to its own graduates of superior standing, and to similarly qualified holders of bachelor's degrees from other recognized institutions. Possession of a degree does not automatically guarantee admission to graduate work. Applicants will be screened by the department concerned and by the Committee on Graduate Instruction, and will be required to submit evidence of suitable preparation and of ability to do work of the quality expected. Those interested should apply to the Registrar not later than July 15.

The courses outlined below indicate the general nature of the requirements for the degree of Master of Science in the several fields of engineering. In addition, a candidate may be required to pass courses which he has not previously taken, but which are required by the Rice Institute for the degree of Bachelor of Science in the field of engineering concerned. Furthermore, attention is called to the fact that completion of the courses indicated below will not automatically lead to the award of a degree. The general quality of the candidate's course work, as well as the quality of his thesis, will be carefully considered by the department concerned and by the Committee on Graduate Instruction before he is recommended to the faculty for a Master of Science degree. In exceptional cases, a student may complete the necessary work in one year, but more often he should count on a minimum of two years, particularly if he is a holder of an assistantship requiring some teaching or other service.

Requirements for the Degree of Master of Science
in Chemical Engineering

(1) Approved graduate course in chemical engineering
(2) Approved graduate course in chemical engineering
(3) Approved science-engineering elective
(4) Seminar (Ch.E. 590b) (second half-year)
(5) Research and Thesis (Ch.E. 585)

* See also page 2 for language requirement.
Requirements for the Degree of Master of Science in Civil Engineering

1. Advanced course in Structures
2. Approved elective in engineering
3. Approved elective in mathematics, physics, chemistry, biology, or engineering other than civil
4. Research and Thesis (C.E. 530)
5. Graduate Seminar (C.E. 505)

Requirements for the Degree of Master of Science in Electrical Engineering

1. Advanced Circuit Analysis (E.E. 500)
2. Research and Thesis (E.E. 530)
3. Advanced Electrical Power Engineering (E.E. 520), or Advanced Communications Engineering (E.E. 540), or Servo-mechanisms (E.E. 510)
4. Approved elective in mathematics, physics, or engineering
5. Approved elective
6. Graduate Seminar (E.E. 505)

Requirements for the Degree of Master of Science in Mechanical Engineering

1. Approved graduate course in mechanical engineering
2. Approved course in Structures
3–4. Two approved electives in mathematics, physics, chemistry, or engineering
5. Research and Thesis (M.E. 550)
6. Graduate Seminar (M.E. 505)

Courses in Chemical Engineering

Chemical Engineering 515a. Chemical Engineering Mathematics. Three hours weekly during the first half-year. Applications of mathematical principles to problems in fluid dynamics, heat transfer, mass transfer, and thermodynamics.

Chemical Engineering 520b. Advanced Topics in Chemical Engineering (I): Fluid Dynamics and Heat Transfer. Three lectures weekly during the second half-year. An advanced study of the
flow of compressible and incompressible fluids, with emphasis upon velocity and pressure distribution and momentum transfer; followed by a consideration of thermal transfer in both compressible and incompressible fluids, with emphasis upon the analogy between the transfer of momentum and transfer of heat.

Chemical Engineering 525a. Chemical Literature. One lecture weekly during the first half-year. The course is devoted to study of the arrangement of chemical literature and its use in industrial and research work. A topic will be assigned to each student every week for a thorough library investigation.

Staff

Chemical Engineering 555a. Chemical Reaction Kinetics. Three lectures weekly during the first half-year. A study of the principal facts and theories relating to the rates at which chemical reactions take place, including a study both of elementary reactions and of the way in which over-all rates of complex reactions are related to the rates of the individual steps.

Mr. Akers

Chemical Engineering 560b. Reservoir Mechanics. Three lectures weekly during the second half-year. Physical properties of hydrocarbons at elevated pressures and temperatures, flow of fluids through porous media, estimating size of petroleum reservoirs, and optimum production procedures.

Mr. Akers

Chemical Engineering 565a. Advanced Topics in Chemical Engineering (II): Mass Transfer. Three lectures weekly during the first half-year. Consideration of material transfer in fluid systems under turbulent flow conditions, with emphasis upon development from fundamental principles and upon analogy between transfer of mass and transfer of momentum. This course includes a study of the development of special relations for the industrially important mass transfer operations.

Mr. McBride

Chemical Engineering 570b. Distillation. Three lectures weekly during the second half-year. A study of the rectification of binary
and multicomponent mixtures and of the methods of computing the performance of both plate and packed towers.

Chemical Engineering 575a. Physical Equilibrium in Fluid Systems. Three lectures weekly during the first half-year. A development, from thermodynamic principles, of the volume and phase equilibrium behavior of binary and multicomponent systems, including both ideal and nonideal systems and behavior at both low and high pressures.

Chemical Engineering 580b. Process Design. Three lectures weekly during the second half-year. The design and operation of a chemical process, taking into account the effects of the operating conditions and materials of construction upon the ultimate economic return from the process.

Mr. Akers

Chemical Engineering 585. Research and Thesis. At least nine hours of work weekly under the direction of a member of the staff on a problem of chemical engineering importance. Four copies of the accepted report will be required: two for deposit in the Institute library and two for the chemical engineering department.

Chemical Engineering 590b. Seminar. One hour weekly during the second half-year. A course for training chemical engineering students in the preparation and oral presentation of formal papers and discussions on topics of engineering interest. The papers and discussions are given by the students, using acceptable material secured from technical publications.

Staff

Chemical Engineering 700. Summer Graduate Research. Open only to students already admitted as candidates for an advanced degree. At least forty hours of laboratory work per week.

Courses in Civil Engineering

Civil Engineering 465. Elementary Structural Design. Three lectures and one laboratory period weekly.
Civil Engineering 500. *Statically Indeterminate Structures and Advanced Structural Design.* A study of stresses and deflections in indeterminate structures such as continuous spans, rigid frames, and arches, by the classical and modern methods of analysis. Design of a rigid-frame mill building in accordance with a selected building ordinance. Theory of design and methods of construction of masonry structures. Special problems in bending, torsion, and buckling of bars and thin plates and shells. Three lectures and one design period a week. Prerequisite: Steel and Timber Structures or the equivalent.

Civil Engineering 505. *Graduate Seminar.* One hour weekly.

Civil Engineering 510. *Soil Mechanics and Foundations.* A study of the physical properties of soils, theoretical soil mechanics, and application to specific engineering problems such as stability of slopes, design of walls and foundations, seepage, and consolidation. Three lectures and one design period a week. Prerequisites: Strength of Materials, and Mechanics of Liquids.

Civil Engineering 530. *Research and Thesis.* This will consist of an original investigation along some approved line of civil engineering work, an original design, or a critical review of existing work. In every case three complete typewritten or printed reports will be required: two for deposit in the Institute library and one for the civil engineering department.

Courses in Electrical Engineering

Electrical Engineering 500. *Advanced Circuit Analysis.* Dynamic behavior of linear, lumped-constant systems; use of transform and other mathematical methods; general network and transmission system theorems; relation of frequency response and transient behavior. Three hours of lecture and four hours of laboratory work weekly. Two semesters.

Mr. Pfeiffer

Electrical Engineering 505. *Graduate Seminar.* One hour weekly. Two semesters.

Staff

*Mr. Pfeiffer*

Electrical Engineering 520. *Advanced Electrical Power Engineering*. Power plants and substations; transmission and distribution systems; illumination; industrial electronics. Three lectures and four hours of laboratory work weekly. Two semesters.

*Mr. Gentile*

Electrical Engineering 530. *Research and Thesis*. A thorough report on an electrical engineering investigation selected and carried out by the individual student. Three copies of the accepted report will be required: two for deposit in the Institute library and one for the electrical engineering department.

*Mr. Wischmeyer*

Electrical Engineering 540. *Advanced Communications Engineering*. Electromagnetic theory and wave propagation; microwaves; frequency analysis; modulation; electro-acoustical systems; noise. Three lectures and four hours of laboratory work weekly. Two semesters.

*Mr. Wischmeyer*

Courses in Mechanical Engineering

Mechanical Engineering 500. *Advanced Engineering Mechanics*. Stress and strain at a point, strength theories, and fatigue; elementary theory of elasticity applied to problems of interest to mechanical engineers. Elementary dynamics, balancing, and gyroscopes; mechanical vibration theory with application to critical speed of rotating shafts, vibration absorbers, and vibration of internal-combustion engines. Three lectures weekly.

*Mr. Plunkett*

Mechanical Engineering 505. *Graduate Seminar*. One hour weekly.

*Staff*
Mechanical Engineering 510. Advanced Power Engineering. Design and operation of industrial and central steam stations; heat balance studies; economic selection of boilers, turbines, condensers, and auxiliaries. Three lectures weekly for one semester.

Mr. Woodburn

Mechanical Engineering 520. Steam and Gas Turbines. Design of component parts of steam and gas turbines; governing and control mechanisms; plant cycles and performance. Three lectures weekly for one semester.

Mr. Woodburn


Mechanical Engineering 550. Research and Thesis. A report on an engineering investigation carried out by the individual student under the direction of a member of the staff in mechanical engineering. Nine hours of research weekly. Three copies of the accepted report will be required: two for deposit in the Institute library and one for the mechanical engineering department.


Mr. Plunkett


Mr. Plunkett

Mechanical Engineering 570b. Controls and Servo-mechanisms. Control of continuous processes. Dynamics of governors and tem-
perature regulators. Dynamics of tracking mechanisms and contour machines. Emphasis will be placed on design as well as analysis. Three lectures and three hours of laboratory work weekly during the second half-year.

Mr. Plunkett
GRADUATE WORK IN ARCHITECTURE

Students who hold the degree of Bachelor of Science in Architecture and who give evidence of their qualifications to the satisfaction of the department of architecture and the Committee on Graduate Instruction may be admitted to candidacy for the degree of Master in Architecture. A minimum of one year of graduate study is required for the master's degree when the candidate already has completed five years' work in a recognized school of architecture, and has received his degree with a record of high scholarship. The candidate must have had at least two years of college work in a foreign language, preferably French.¹ Candidates whose preparation has been limited to four years will be required to take two years of graduate work to reach their master's degree.

The candidate for the master's degree shall take the equivalent of four graduate courses, which shall consist of (a) personal investigation, the results of which must be submitted as a thesis; (b) at least two advanced courses, one of which must be a graduate course in architecture. The candidate must pass a public oral examination given by the faculty. The candidate may elect as his major work Architecture 600, 610, or 630. Should he elect the field of history or the field of construction, there will be required in either course a minimum of fifteen hours of drawing and research.

Courses in Architecture

Architecture 600. Postgraduate Design. A course for students who have received the degree of Bachelor of Science in Architecture. Advanced study and research in architectural design or city planning. The subject of study for the thesis shall be chosen with the approval of the faculty, and a written thesis presenting the results of the study will be required. Three hours of conference, fifteen hours of drawing and research.

Messrs. Dunaway, Lent, and Watkin

¹ See also page 2 for language requirement.
Architecture 610. Postgraduate Architectural History. A course for students who have received the degree of Bachelor of Science in Architecture. An advanced course of study and research in the field of architectural history. Three hours of conference, six hours of research.

Messrs. Chillman and Gates

Architecture 630. Postgraduate Construction. A course for students who have received the degree of Bachelor of Science in Architecture. An advanced course of study in the field of architectural construction. Three hours of conference, nine hours of drawing and research.

Messrs. Leifeste and Morehead
<table>
<thead>
<tr>
<th>YEAR</th>
<th>NAME</th>
<th>DEPARTMENT</th>
<th>THESIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1918</td>
<td>Hubert Evelyn Bray</td>
<td>Mathematics</td>
<td>A Green's theorem in terms of Lebesgue integrals.</td>
</tr>
<tr>
<td>1919</td>
<td>Jacob Leighty Sherrick</td>
<td>Chemistry</td>
<td>Adsorption by precipitates.</td>
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<tr>
<td>1920</td>
<td>Norman Hurd Ricker</td>
<td>Physics</td>
<td>The luminosity of mercury vapor distilled from the arc in vacuo.</td>
</tr>
<tr>
<td>1921</td>
<td>Allen Darnaby Garrison</td>
<td>Chemistry</td>
<td>The oxidation and luminescence of phosphorus.</td>
</tr>
<tr>
<td>1922</td>
<td>Andrew Bonnell Bryan</td>
<td>Physics</td>
<td>I. Dielectric losses at radio frequencies in liquid dielectrics. II. The electrical properties of flames containing salt vapors for high frequency alternating currents. III. The conductivity of flames for rapidly alternating currents.</td>
</tr>
<tr>
<td>1924</td>
<td>Aristotle Michal</td>
<td>Mathematics</td>
<td>Integro-differential expressions invariant under Volterra's group of transformations.</td>
</tr>
<tr>
<td>1925</td>
<td>Gaylord Johnson</td>
<td>Chemistry</td>
<td>The preparation and chemical properties of the propinyl halides.</td>
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<td></td>
<td>Alfred Joseph Maria</td>
<td>Mathematics</td>
<td>Functions of plurisegments.</td>
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<tr>
<td>1926</td>
<td>Charles Frederick Roos</td>
<td>Mathematics</td>
<td>I. A mathematical theory of competition. II. Generalized Lagrange problems.</td>
</tr>
<tr>
<td>1927</td>
<td>Everett Ellis Porter</td>
<td>Chemistry</td>
<td>The physical chemistry of color lake formation.</td>
</tr>
<tr>
<td>1928</td>
<td>Paul Edward Boucher</td>
<td>Physics</td>
<td>I. The drop of potential at the cathode in flames. II. The measurement of the resonance, radiation, and ionization potentials of several gases and vapors. III. The mobility of negative ions in gasoline, hydrogen, and hydrogen-chlorine flames.</td>
</tr>
<tr>
<td></td>
<td>Geoffrey Everett Cunningham</td>
<td>Chemistry</td>
<td>Adsorption of ions and the physical character of precipitates.</td>
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<tr>
<td>Year</td>
<td>Name</td>
<td>Department</td>
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<tr>
<td></td>
<td>John Jay Gergen</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>I. Quelques théorèmes sur les séries de Taylor. II. On generalized lacunae. III. On Taylor’s series admitting the circle of convergence as a singular curve. IV. On accessible points on the boundary of a three dimensional region. V. Mapping of a general type of three dimensional region on a sphere.</td>
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<tr>
<td>1929</td>
<td>Nat Edmonson, Jr.</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>Poisson’s integral and plurisegments on the hypersphere.</td>
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<td></td>
<td>Deborah May Hickey</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>A three-dimensional treatment of groups of linear transformations.</td>
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<td></td>
<td>Edward Roy Cecil Miles</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>George Holmes Richter</td>
<td>Chemistry</td>
<td></td>
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<tr>
<td>1930</td>
<td>Edward Josephi Durham</td>
<td>Chemistry</td>
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<tr>
<td></td>
<td>Studies in the solubilities of the soluble electrolytes.</td>
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<td></td>
<td>Ray Nelson Haskell</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>The mixed problem for harmonic functions with discontinuous boundary conditions.</td>
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<td></td>
<td>Clyde Roland Johnson</td>
<td>Chemistry</td>
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<tr>
<td></td>
<td>The atomic weights of chlorine and vanadium.</td>
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<td>1931</td>
<td>Edwin Ford Beckenbach</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>Minimal surfaces in Euclidean N-space.</td>
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<td></td>
<td>Charles Hewitt Dix</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>Lattice regions and their application in dynamics.</td>
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<td></td>
<td>William Maurice Ewing</td>
<td>Physics</td>
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<td></td>
<td>I. A new method of treating certain problems of seismic prospecting. II. Seismic propagation paths. III. Paths of seismic waves. IV. Comparison of two methods for the interpretation of seismic time-distance graphs which are smooth curves. V. Velocity of explosion-generated longitudinal waves in a nepheline syenite.</td>
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<td></td>
<td>Paul Duane Harwood</td>
<td>Biology</td>
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<td></td>
<td>The helminths parasitic in the Amphibia and Reptilia of Houston, Texas, and vicinity.</td>
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<td></td>
<td>William Monroe Rust, Jr.</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>Integral equations and the cooling problem for several media.</td>
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<td>Year</td>
<td>Name</td>
<td>Department</td>
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<tr>
<td>1932</td>
<td>Henry Eugene Banta</td>
<td>Physics</td>
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<tr>
<td></td>
<td>Some thermo- and galvanomagnetic properties of a bismuth crystal.</td>
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<tr>
<td>1933</td>
<td>Gordon Lee Locher</td>
<td>Physics</td>
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<tr>
<td></td>
<td>I. The compound photoelectric effect of X-rays in light elements. II. Attempts to induce radioactivity in matter. III. A photoelectric Geiger-Müller counter. IV. A large reciprocating C. T. R. Wilson cloud expansion apparatus. V. The time intervals between the appearance of spectral lines in the spectra of alkali and alkaline-earth metals VI. Luminosity of flames containing sodium vapor. VII. A line-conic camera. VIII. New experiment bearing on cosmic-ray phenomena. IX. Cosmic-ray particles.</td>
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<tr>
<td>1934</td>
<td>John Henry Binney</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>An elliptic system of integral equations on summable functions.</td>
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<td>1935</td>
<td>Tom Wilkerson Bonner</td>
<td>Physics</td>
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<tr>
<td></td>
<td>I. Collisions of neutrons with atomic nuclei. II. The energy distribution of the neutrons from fluorine. III. The energy distribution of neutrons from boron. IV. Emission of neutrons from fluorine and beryllium. V. Ionization of gases by neutrons. VI. Dependence of the absorption of neutrons on their velocity. VII. Luminosity of a flame containing sodium vapor.</td>
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<tr>
<td></td>
<td>George Robert Gray</td>
<td>Chemistry</td>
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<tr>
<td></td>
<td>Hydrogen ion displacement during the coagulation of arsenic trisulfide sol and sulfur sol.</td>
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<td></td>
<td>Homer Clarence Matthes</td>
<td>Biology</td>
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<tr>
<td></td>
<td>A study of the seasonal distribution of Anopheles in Houston, Texas.</td>
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<td></td>
<td>Winfred O. Milligan</td>
<td>Chemistry</td>
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<tr>
<td></td>
<td>X-ray studies on the hydrous oxides.</td>
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<td>Frances Douglas Ward</td>
<td>Biology</td>
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<td></td>
<td>The production of mutations in Drosophila melanogaster by irradiation with alpha-rays.</td>
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<td></td>
<td>Paul Livingston Burlingame</td>
<td>Biology</td>
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<td></td>
<td>On the environmental nature of resistance in the albino rat to single and superimposed infestations with an acanthocephalan (Moniliformis moniliformis).</td>
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</tr>
</tbody>
</table>
George Alvin Garrett Mathematics
Necessary and sufficient conditions for potentials of single and double layers.

John Tom Hurt Mathematics
On the uniformly bounded turning of level curves of the Green's function.

William Grosvenor Pollard Physics
I. Theory of the beta-ray type of radioactive disintegration. II. Energy distribution in cosmic rays.

James Henry Sawyer, Jr. Physics
I. Shower-producing cosmic rays. II. The secondary and tertiary particles produced by cosmic rays.

Frederic Allen Scott Physics

Millard Seals Taggart Chemistry
I. Synthesis of pyrrole alcohols and their derivatives. II. Constitution of the sapogenine of the saponine of white soaproot.

Joseph Williams Hahn Mathematics
Projective transformations in two complex variables.

Hughes Mead Zenor Physics
I. The cooling of a surface, due to photoelectric emission. II. A search for induced radioactivity produced by cosmic rays. III. A pseudo-example of the conservation of angular momentum. IV. Pascal's law in fluids in radial fields of force. V. Photoelectric emission from cadmium and mercury. VI. Photoelectric emission from cadmium films. VII. Acoustics of the fine arts auditorium of the University of Oklahoma.

Joseph Ilott Davies Biology
Studies on the behavior of transplanted ovaries and a suggested hypothesis as to the interrelations of the various cellular elements of the ovary.

Frank House Hurley, Jr. Chemistry
The atomic weight of carbon; the ratio of benzoyl chloride to silver.

Ernest Carlton Kennedy Mathematics
Fuchsian groups of genus two.

Walter Tandy Scott Mathematics
On continued fractions and infinite products.
<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Department</th>
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</thead>
<tbody>
<tr>
<td>1939</td>
<td>William Joseph Coppoc</td>
<td>Chemistry</td>
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<tr>
<td></td>
<td>The constitution of the alleged Thiessen hydrates from isothermal dehydration.</td>
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<td></td>
<td>Julian Frank Evans</td>
<td>Physics</td>
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<td></td>
<td>Examination of additively colored alkali halides for photoelectric Hall effect.</td>
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<td></td>
<td>Eby Nell McElrath</td>
<td>Chemistry</td>
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<td></td>
<td>Studies on the alkyldioxynaphthalene-carboxylic acid derivatives.</td>
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<td></td>
<td>Edward Preble Offutt, Jr.</td>
<td>Biology</td>
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<td></td>
<td>Studies on the oligodynamic action of silver.</td>
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<tr>
<td></td>
<td>Fred Terry Rogers, Jr.</td>
<td>Physics</td>
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<tr>
<td></td>
<td>An independent determination of the binding energy of the deuteron.</td>
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<tr>
<td>1940</td>
<td>Emmett Leroy Hudspeth</td>
<td>Physics</td>
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<tr>
<td></td>
<td>I. Anomalous scattering of neutrons by helium and the d-d neutron spectrum.</td>
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<tr>
<td></td>
<td>II. Electroscope investigation of the anomalous scattering of neutrons by helium.</td>
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<tr>
<td></td>
<td>III. Resonances in the disintegration of carbon by deuterons.</td>
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<td></td>
<td>IV. Observation of H(^1) and H(^3) ranges from the disintegration of deuterium by deuterons.</td>
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<td></td>
<td>V. Low energy neutrons from the deuteron-deuteron reaction.</td>
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<tr>
<td></td>
<td>John Purcell Nash</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>A class of continuous functions and convergence criteria for their Fourier series.</td>
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<tr>
<td></td>
<td>Maxwell Ossian Reade</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>Generalizations to space of the Cauchy and Morera theorems.</td>
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<tr>
<td></td>
<td>Marguerite Moilliet Rogers</td>
<td>Physics</td>
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<tr>
<td></td>
<td>A determination of the masses and velocities of three radium B beta-particles.</td>
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<tr>
<td></td>
<td>Vernon Truett Schuhardt</td>
<td>Biology</td>
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<tr>
<td></td>
<td>Studies of the Falls Creek (Texas) strain of relapsing fever spirochetes.</td>
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<tr>
<td></td>
<td>Karl Cornelius ten Brink</td>
<td>Chemistry</td>
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<tr>
<td></td>
<td>Adsorption studies on clays.</td>
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<td>1941</td>
<td>James Douglas Bankier</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>Arithmetical continued fractions.</td>
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<tr>
<td></td>
<td>John Bertram Bates</td>
<td>Chemistry</td>
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<tr>
<td></td>
<td>X-ray diffraction studies on heavy metal iron-cyanides.</td>
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<td></td>
<td>James Fred Denton, Jr.</td>
<td>Biology</td>
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<td>Studies on the morphology, taxonomy, and life histories of trematodes of the subfamily Dicrocoeliinae Looss, 1899.</td>
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<tr>
<td>1942</td>
<td>Henry Francis Dunlap</td>
<td>Physics</td>
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<tr>
<td></td>
<td>The scattering of fast neutrons by lead.</td>
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<td>1942</td>
<td>Price Bush Elkin</td>
<td>Chemistry</td>
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<td></td>
<td>Adsorption studies on clays.</td>
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<tr>
<td>1942</td>
<td>James Holmes</td>
<td>Chemistry</td>
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<td>The constitution of silica gel.</td>
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<td>1942</td>
<td>James Curtiss Schiller</td>
<td>Chemistry</td>
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<td></td>
<td>A study of the bromination of saturated organic compounds.</td>
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<td>1942</td>
<td>Nat Huyler Marsh</td>
<td>Chemistry</td>
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<td>A study of cracked gasoline and the reaction of bromine with primary aliphatic alcohols.</td>
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<tr>
<td>1942</td>
<td>Donald Vincent Moore</td>
<td>Biology</td>
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<td></td>
<td>Studies on the life history and development of certain Acanthocephala of the order Archiacanthocephala (Meyer, 1931).</td>
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<tr>
<td>1942</td>
<td>Hugh Taylor Richards</td>
<td>Physics</td>
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<tr>
<td></td>
<td>Transmutations of lithium by deuterons.</td>
<td></td>
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<tr>
<td>1943</td>
<td>Robert Narvaez Little, Jr.</td>
<td>Physics</td>
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<td></td>
<td>Neutron scattering by magnesium.</td>
<td></td>
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<tr>
<td>1943</td>
<td>Charles Earle Mandeville, Jr.</td>
<td>Physics</td>
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<td></td>
<td>The energies of some nuclear gamma-rays.</td>
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<td>1943</td>
<td>George Piranian</td>
<td>Mathematics</td>
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<td></td>
<td>A study of the position and nature of the singularities of functions given by their Taylor series.</td>
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<td>1943</td>
<td>Wolfgang Joseph Thron</td>
<td>Mathematics</td>
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<td></td>
<td>Convergence regions for continued fractions.</td>
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<tr>
<td>1943</td>
<td>Thomas Percy Wier, Jr.</td>
<td>Chemistry</td>
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<tr>
<td></td>
<td>The electrodeposition of aluminium.</td>
<td></td>
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<tr>
<td>1944</td>
<td>Hugh Daniel Brunk</td>
<td>Mathematics</td>
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<tr>
<td>(Feb.)</td>
<td>Some generalizations for Dirichlet’s series of Hadamard’s theorem with applications.</td>
<td></td>
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<tr>
<td>1944</td>
<td>Vincent Frederick Cowling</td>
<td>Mathematics</td>
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<tr>
<td>(Oct.)</td>
<td>On functions defined by a Taylor series.</td>
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<tr>
<td>1944</td>
<td>Charles Sedwick Matthews</td>
<td>Chemistry</td>
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<td></td>
<td>A study of alumina-silica-fluorine combinations as hydrocarbon conversion catalysts.</td>
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<td>1944</td>
<td>Warren Candler Simpson</td>
<td>Chemistry</td>
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<td>Electron diffraction studies on alumina films.</td>
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<tr>
<td>1945</td>
<td>Clarence John Addis, Jr.</td>
<td>Biology</td>
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<td></td>
<td>(June) I. Factors influencing the growth of tapeworms (<em>Hymenolepis diminuta</em>). II. Studies on the sandflies of Texas (<em>Phlebotomus</em>).</td>
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<td></td>
<td>Robert Warren Long</td>
<td>Physics</td>
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<td></td>
<td>Neutron scattering in iron.</td>
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<tr>
<td>1946</td>
<td>Gerald Robinson MacLane</td>
<td>Mathematics</td>
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<td></td>
<td>(March) Concerning the uniformization of certain Riemann surfaces allied to the inverse cosine and inverse gamma surfaces.</td>
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<td>1946</td>
<td>Bob Everett Watt</td>
<td>Physics</td>
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<td>(June) I. Resonances in the disintegration of fluorine by protons. II. Protons from C$^{18}$ + H$^2$. III. The energy of the $\gamma$-rays from the disintegration of fluorine by protons and deuterons. IV. The disintegration of carbon by deuterons. V. High energy gamma-ray from Li + D. VI. An integrator for small currents.</td>
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<td>1947</td>
<td>John Ellis Evans</td>
<td>Physics</td>
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<td></td>
<td>I. A study of gamma-ray resonances produced by proton bombardment of lithium and fluorine. II. The energy distribution of alpha-particles from Be$^8$ formed by the beta-decay of Li$^8$.</td>
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<td>Wilton Monroe Fisher</td>
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<td>Studies on transovarial infection with <em>Borrelia recurrentis</em> var. <em>turi</em>cat<em>ae</em> in <em>Ornithodoros turicata</em>.</td>
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<td>Charles Wilson Malich</td>
<td>Physics</td>
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<td>The disintegration of beryllium by deuterons.</td>
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<td>Jackson Dan Webster</td>
<td>Biology</td>
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<td></td>
<td>I. Studies on the life cycle of <em>Mesocestoides latus</em> Mueller. II. The helminth parasites of the bob-white quail.</td>
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<td>1948</td>
<td>Henry Ernest Baumgarten</td>
<td>Chemistry</td>
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<td>A study of the naphthenic acids from Aruba petroleum.</td>
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<td>Gordon Lake Bushey</td>
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<td>Isobaric and isothermal dehydration studies on pure soap crystals.</td>
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<td>James Colwell Harris</td>
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<td>Resonances for carbon bombarded by deuterons.</td>
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<td>Neville Carter Hunsaker</td>
<td>Mathematics</td>
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<td></td>
<td>Extremal curves for the modulus of an analytic function.</td>
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<td>1949</td>
<td>Robert Francis Blunt</td>
<td>Physics</td>
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<td></td>
<td>The dielectric properties of barium titanate at low temperatures.</td>
<td></td>
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<td></td>
<td>Norman Bell Godfrey</td>
<td>Chemistry</td>
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<td>The mechanism of the decomposition of diazonium salts in hydroxylic solvents.</td>
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<td>Gerald Cleveland Phillips</td>
<td>Physics</td>
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<td>Ward Whaling</td>
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<td>John Joseph Banewicz</td>
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<td>Jacob Walter Beck</td>
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<td>David Jacob Besdin</td>
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<td>Robert Elwyn Fariss</td>
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<td>Wallace Simpson Hay</td>
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<td>Chester Stephen Morgan, Jr.</td>
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<td>William Calvin Overton, Jr.</td>
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<td>Clark Phares Read, Jr.</td>
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<td>Jasper Edgar Richardson</td>
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<td>Howard Edward Taylor</td>
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<td>Nelson James Terrell, Jr.</td>
<td>Physics</td>
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<td>Harry Bernard Whitehurst</td>
<td>Chemistry</td>
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RECENT PUBLICATIONS

ADAMS, E. T.
(See TALMAGE.)

AGMON, SHMUUEL
(See also MANDELBROJT.)

ALTENBURG, EDGAR
(See also ALTENBURG, L.)

ALTENBURG, LUOLIN
“The Uptake of Radiophosphorus by Vaccinia Virus and Its Associated Components” (abstract), Anatomical Record, CV (1949), 74–75.

ALTENBURG, LUOLIN, EDGAR ALTENBURG, HELEN U. MEYER, AND H. J. MULLER
“The Lack of Proportionality of Mutations Recovered to Dosage of Ultraviolet Administered to the Polar Cap of Drosophila” (abstract), Records of the Genetic Society of America, No. 18 (1949), 75.

MEYER, HELEN U., MARGARET EDMUNDSON, LUOLIN ALTENBURG, AND H. J. MULLER
“Studies on Mutations Induced by Ultraviolet in the Polar Cap

1 By staff members and graduate students, or based on work done at the Rice Institute.

**BAGGETT, L. M.**

*(See also BAME.)*

**BAGGETT, L. M., AND S. J. BAME, JR.**


**BAME, S. J., JR.**

*(See also BAGGETT.)*

**BAME, S. J., JR., AND L. M. BAGGETT**


**BANG, THÖGER**

"Metric Spaces of Indefinitely Differentiable Functions" (abstract), *Proceedings of the International Congress of Mathematicians* (1950). (Forthcoming.)


"Sur les Points Singuliers (dans un Sens Généralisé) des Fonctions Indéfiniment Dérivables," XIème Congrès des Mathématiciens Scandinaves (Trondheim, 1949). (Forthcoming.)

**BARRETT, JOHN HAROLD**


**BECK, J. WALTER**

*(See also TALMAGE.)*

"Megacirrus megapodii, n.g., n.sp., a Cestode from the Malayan Brush Turkey, *Megapodius laperouse senex* (Cestoda, Dilepididae)." (Forthcoming.)

**BLAIR, LEON B.**


**BLUNT, R. F.**

**BLUNT, R. F., W. F. LOVE, AND E. N. SKOMAL**


**BONNER, T. W.**

(See also WHALING.)

**BONNER, T. W., J. E. EVANS, J. C. HARRIS, AND G. C. PHILLIPS**


**BONNER, T. W., J. E. EVANS, AND J. E. HILL**


**BOURJEOIS, ANDRÉ**


Review of Maurois, André, *Nouveaux Discours du Docteur*
RECENT PUBLICATIONS

O’Grady (Montreal: Le Cercle du Livre de France, 1950), in Books Abroad. (Forthcoming.)

Review of Monnier, Mme. Thyde, MOI, II, La Saison des Amours (Monaco: Edition du Rocher, 1950), in Books Abroad. (Forthcoming.)


“Siesta,” in Poèmes Français de Poètes Étrangers (Paris: Ed. de la Revue Moderne). (Forthcoming.)

BRUNK, H. D.

(See also MANDELBROJT.)


BURR, J. H.

(See TALMAGE.)

BUSHEY, GORDON L.

(See MILLIGAN.)

BUTLER, J. W.

(See WHALING.)

CAMDEN, CARROLL

“The Elizabethan Imogen,” The Rice Institute Pamphlet, XXXVIII, No. 1 (April, 1951). (Forthcoming.)

CHANDLER, ASA C.

(See also MELVIN.)


CHANDLER, ASA C., AND D. M. MELVIN

"A New Cestode, Oochoristica pennsylvanica, and Some New or Rare Helminth Host Records from Pennsylvania Mammals.” (Forthcoming.)

CHANDLER, ASA C., CLARK P. READ, AND H. O. NICHOLAS


DIAS, E., AND ASA C. CHANDLER

"Human Diseases Transmitted by Parasitic Bugs," Memórias do Instituto Oswaldo Cruz (Rio de Janeiro). (Forthcoming.)

CHILLMAN, JAMES, JR.

"Art in Houston,” in Houston; Text by Houstonians (Marrero, La.: Hope Haven Press, 1949), 69–73.

COOKENBOO, L.

CRAIG, HARDIN, JR.

"Black Dick Howe, the Sailor’s Friend,” Mariner’s Mirror, XXXV (1949), 18–28.

DAVIS, JACK F.


DEZURKO, EDWARD R.


DIX, WILLIAM S.

“Rice Institute’s Fondren Library Takes a Forward Look in Education,” Houston, XX (August, 1949), 8–9.

DOWDEN, WILFRED SELLERS

“The Consistency in Byron’s Social Doctrine,” The Rice Institute Pamphlet, XXXVII, No. 3 (October, 1950), 18–44.
“A Jacobin Journal’s View of Lord Byron,” Studies in Philology. (Forthcoming.)
“Shelley’s Use of Metempsychosis in The Revolt of Islam,” The Rice Institute Pamphlet, XXXVIII, No. 1 (April, 1951). (Forthcoming.)
“The Source of the Metempsychosis Motif in Southey’s Thalaba,” Modern Language Notes. (Forthcoming.)

DRAPER, ARTHUR L.

(See also MILLIGAN.)
DRAPER, ARTHUR L., AND W. O. MILLIGAN

DVORETZKY, ISAAC
DVORETZKY, ISAAC, AND GEORGE HOLMES RICHTER
“Formaldehyde Condensation in the Pyrazole Series,” Journal of Organic Chemistry. (Forthcoming.)

EVANS, J. E.
(See also BONNER and WHALING.)

EVANS, J. E., C. W. MALICH, AND J. R. RISSER

FISCHER, KATHERINE

FROST, R. C.
(See TALMAGE.)

FULTON, JAMES STREET

GARRETT, FERN A.
(See TALMAGE.)
GARRISON, ALLEN D.

*Experiments in Physical Chemistry* (St. Louis: John S. Swift Co., 1950), pp. i, 70.

HARRIS, J. C.

(See BONNER.)

HEAPS, CLAUDE W.


HODGES, JOHN E.


HOUSTON, WILLIAM VERMILLION


HOUSTON, W. V., AND N. MUEENCH


HOUSTON, W. V., AND C. F. SQUIRE


HUDSON, BRADFORD B.


HUDSPETH, C. M.


HURST, W. R.

(See TALMAGE.)

KILPATRICK, J. E.

"Coupling of Rotation and Vibration in Molecules," *Journal of Chemical Physics* (1951). (Forthcoming.)
"Note on the Vapor Pressure of $\text{He}_3$, $\text{He}_4$ Solutions," *Physical Review, LXXIX* (1950), 529.

**Kilpatrick, J. E., C. W. Beckett, E. J. Prosen, K. S. Pitzer, and F. D. Rossini**


**Kilpatrick, J. E., and Myra F. Kilpatrick**


**Kilpatrick, J. E., and K. S. Pitzer**

"Energy Levels and Thermodynamic Functions of Molecules with Internal Rotation. III Compound Rotation," *Journal of Chemical Physics, XVII* (1949), 1064.

**Kilpatrick, Myra F., and J. E. Kilpatrick**


**Lear, Floyd Seyward**


LEWIS, E. S.

BARTLETT, PAUL D., SAUL G. COHEN, JOHN D. COTMAN, JR., NATHAN KORNBLUM, JOSEPHINE R. LANDRY, AND EDWARD S. LEWIS


BARTLETT, P. D., AND E. S. LEWIS


LOUIS, ANDREW

*German Reading Grammar.* (Forthcoming.)

LOVE, W. F.

(See BLUNT.)

McATEE, J. L.

MCATEE, J. L., AND W. O. MILLIGAN


McBRIDE, GUY T., JR.

LEWIS, W. K., E. R. GILLILAND, AND GUY T. McBRIDE, JR.


MCKILLOP, ALAN D.


"Epistolary Technique in Richardson's Novels," *The Rice Institute Pamphlet*, XXXVIII, No. 1 (April, 1951). (Forthcoming.)


"Peter the Great in Thomson's Seasons," *Modern Language Notes*. (Forthcoming.)


MACLANE, G. R.

"Approximation by the Derivatives of an Entire Function." (Forthcoming.)


"Rational Functions with All Zeros and Poles on a Rectifiable Jordan Curve" (abstract), Bulletin of the American Mathematical Society, LV (1949), 287.

"Riemann Surfaces and Asymptotic Values Associated with Certain Real Entire Functions" (abstract), Proceedings of the International Congress of Mathematicians (1950). (Forthcoming.)

MALICH, C. W.

(See EVANS.)

MANDELBROJT, S.

"Mandelbrojt Composition Theorems," The Rice Institute Pamphlet, XXXVIII, No. 2 (July, 1951). (Forthcoming.)


MANDELBROJT, S., AND SHMUEL AGMON


MANDELBROJT, S., AND H. D. BRUNK


MANDELBROJT, S., AND F. E. ULRICH

"Concerning Regions of Flatness for Holomorphic Functions
and Their Derivations," *Duke Mathematical Journal.* (Forthcoming.)

MASTERS, WILLIAM HENRY


MELVIN, DOROTHY M.

(See also CHANDLER.)

"The Life Cycle of *Monoecocestus sigmodontis* (Cestoda, Anoplocephalidae) from the Cotton Rat, *Sigmodon hispidus*" (abstract), *Journal of Parasitology,* XXXVI (1950), Supplement. (Forthcoming.)

MELVIN, DOROTHY M., AND ASA C. CHANDLER


MERRIFIELD, PAUL E.

(See WEISER.)

MILLIGAN, W. O.

(See also DRAPER and McATEE.)

"Recent X-ray Diffraction Studies on the Hydrous Oxides and Hydroxides," *Journal of Physical and Colloid Chemistry.* (Forthcoming.)

MILLIGAN, W. O., GORDON L. BUSHEY, AND ARTHUR L. DRAPER

"Isobaric and Isothermal Studies in the System Soap-Water," *Journal of Physical and Colloid Chemistry.* (Forthcoming.)

MILLIGAN, W. O., AND C. S. MORGAN, JR.

"Adsorption of Water Vapor on Ferric Oxide—Chromic Oxide Gels," *American Chemical Society Abstracts of Papers,* 117th meeting (March, 1950), 4G.

"High Temperature Adsorption Apparatus," *American Chemical Society Abstracts of Papers,* 117th meeting (March, 1950), 3G–4G.
MILLIGAN, W. O., WARREN C. SIMPSON, GORDON L. BUSHEY, HENRY H. RACHFORD, JR., AND ARTHUR L. DRAPER

"A Precision Multiple Sorption-Desorption Apparatus," Analytical Chemistry. (Forthcoming.)

MILLIGAN, W. O., AND L. W. VERNON

"Crystal Structure of Heavy Metal Orthovanadates," American Chemical Society Abstracts of Papers, 118th meeting (September, 1950), 48Q.

MILLIGAN, W. O., L. MERTEN WATT, AND HENRY H. RACHFORD, JR.


MILLIGAN, W. O., AND HARRY B. WEISER

"Orientation Effects in Transparent Alumina Films," Journal of Physical and Colloid Chemistry. (Forthcoming.)

MIRON, SIMON

(See RICHTER.)

MORAUD, MARCEL

Études Franco-Américaines (Paris). (Forthcoming.)

Explorateurs et Pionniers Français dans le Sud des États Unis (1685-1850) (Paris). (Forthcoming.)


Review of Chastenet, Jacques, Le Siècle de Victoria
Fayard, 1947), in Books Abroad, XXIII (1949), 370.

MORGAN, C. S., JR.
(See MILLIGAN.)

MUENCH, N.
(See HOUSTON.)

NICHOLAS, H. O.
(See CHANDLER.)

OVERTON, W. C.
OVERTON, W. C., R. H. PRY, R. W. SCHMITT, AND C. F. SQUIRE

PATTIE, FRANK A.

PHILLIPS, EDWARD HAKE

PHILLIPS, G. C.
(See also BONNER.)
"The Long Range Protons from the Disintegration of Carbon by Deuterons," Physical Review. (Forthcoming.)

PLUNKETT, ROBERT
"Free and Forced Vibrations of Rotating Blades," Journal of the Aeronautical Sciences. (Forthcoming.)


**Plunkett, R., and W. E. Arnoldi**


**Pry, R. H.**

*(See Overton.)*

**Rachford, Henry H., Jr.**

*(See Milligan.)*

**Read, Clark P.**

*(See also Chandler.)*


“The Crowding Effect in Cestode Infections.” (Forthcoming.)

“The Life History and Morphology of *Rhopalias macracanthus* Chandler.” (Forthcoming.)


"Studies on the Intermediary Reactions of Carbohydrate Fermentation in Cestodes (Hymenolepis diminuta)," Experimental Parasitology, I, No. 1. (Forthcoming.)

"The Vertebrate Small Intestine as an Environment for Parasitic Helminths," The Rice Institute Pamphlet, XXXVII, No. 2 (July, 1950), 1–94.

RICHTER, GEORGE HOLMES

(See also DVORETZKY.)


RICHTER, GEORGE HOLMES, AND SIMON MIRON


RISSE, J. R.

(See EVANS.)

SCHMITT, R. W.

(See OVERTON.)

SHALEK, R. J.

(See TALMAGE.)

SIMPSON, WARREN C.

(See MILLIGAN.)

SKOMAL, E. N.

(See BLUNT.)

SQUIRE, C. F.

(See HOUSTON and OVERTON.)
TALMAGE, ROY V.


TALMAGE, R. V., J. W. BECK, AND E. T. ADAMS


TALMAGE, R. V., R. C. FROST, R. J. SHALEK, J. H. BURR, AND F. A. GARRETT


TALMAGE, ROY V., AND F. A. GARRETT

"Effects of Repeated Injections of Estrogen, Progesterone, and Relaxin on the Symphysis Pubis of the Guinea Pig as Studied by X-ray," *Endocrinology* (1951). (Forthcoming.)

TALMAGE, R. V., AND W. R. HURST


THOMAS, J. D.


"$4,500,000 in New Buildings for Rice," *Houston*, XX (April, 1949), 21, 48.


TSANOFF, RADOVLAS A.

"The College Library as a Student's Workshop," *Journal of the Texas Library Association*. (Forthcoming.)


ULRICH, F. E.
(See MANDELBROJT.)

VERNON, L. W.
(See MILLIGAN.)

WALKER, WILLIAM D.


WALKER, W. D., S. P. WALKER, AND K. I. GREISEN

"Mean Free Path of Penetrating Shower Producers," *Physical Review*. (Forthcoming.)

GREISEN, K. I., W. D. WALKER, AND S. P. WALKER

"'N' Component Particles in Extensive Air Showers," *Physical Review*. (Forthcoming.)

WASER, JÜRG


"The Lorentz Factor for the Buerger Precession Method," *American Mineralogist*. (Forthcoming.)

WASER, JÜRG, K. HEDBERG, AND E. W. HUGHES

"The Crystal Structure of Arsenobenzene." (Forthcoming.)

WASER, JÜRG, AND EDWIN D. MCCLANAHAN, JR.

WASER, JÜRG, AND LINUS PAULING

WATKIN, WILLIAM WARD
Planning and Building the Modern Church (New York: F. W. Dodge Corporation, 1951). (Forthcoming.)

WATT, LORE MERTEN
(See MILLIGAN.)

WEBSTER, J. DAN

WEISER, HARRY B.
(See also MILLIGAN.)

WEISER, HARRY B., AND PAUL E. MERRIFIELD

WELTSCH, RUBEN

WHALING, WARD

WHALING, WARD, AND T. W. BONNER
Whaling, Ward, and J. W. Butler

"Neutrons from the Bombardment of Li\textsuperscript{6} by Deuterons," *Physical Review*, LXXVIII (1950), 72-73.

Whaling, Ward, J. E. Evans, and T. W. Bonner

"Neutrons from Deuteron Bombardment of Li\textsuperscript{6}," *Physical Review*, LXXV (1949), 668.

White, Wilbur W.


Whiting, George W.

Articles on Joseph Conrad, *Lord Jim*, *Victory*, and *Youth*, in *Collier's Literary Encyclopedia*. (Forthcoming.)

"Christ's Miraculous Fast," *Modern Language Notes*. (Forthcoming.)


Williams, George G.


"Birds Across the Moon," *Nature Notes from the Gulf Coast Region*, I (1950). (Forthcoming.)

"Creating the Perfect Title," *Writer's Digest*. (Forthcoming.)

"Francis Thompson's 'Grace of the Way,'" *Explicator*. (Forthcoming.)

RECENT PUBLICATIONS


“Selecting Students for Creative Writing Classes,” College English. (Forthcoming.)

“D. H. Lawrence’s Philosophy as Expressed in His Poetry,” The Rice Institute Pamphlet, XXXVIII, No. 1 (April, 1951). (Forthcoming.)

“The Texas Coastal Region” (bi-monthly column), Field Notes, 1941–1951.


WILLIAMS, GEORGE G., AND OTHERS


WILSON, H. A.


WISCHMeyer, CARL R.


WYATT, E. M.

General Blue Print Reading. (Forthcoming.)

YOUNG, HOMER H.

“The National University’ of the Early National Period.” Educational Forum (March, 1951). (Forthcoming.)