THE RICE INSTITUTE PAMPHLET

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GRADUATE ANNOUNCEMENTS
for 1948–1949 of
THE RICE INSTITUTE

FOUNDED BY WILLIAM MARSH RICE

Opened for the Reception of Students
in the Autumn of Nineteen Hundred and Twelve

HOUSTON, TEXAS
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ACADEMIC CALENDAR

1948

September 16-17. . . . Registration
September 18. . . . Matriculation Address
September 20. . . . Opening of Courses
November 24. . . . Beginning of Thanksgiving Recess at 6:00 P.M.
November 29. . . . Resumption of Courses at 8:00 A.M.
December 18. . . . Beginning of Christmas Recess at 1:00 P.M.

1949

January 3. . . . Resumption of Courses at 8:00 A.M.
January 24–February 3. . . February Examinations
February 7. . . . Resumption of Courses at 8:00 A.M.
April 14. . . . Beginning of Easter Recess at 6:00 P.M.¹
April 19. . . . Resumption of Courses at 8:00 A.M.
April 23. . . . Main Entrance Examination Period
May 23–June 3. . . Final Examinations
June 4–6. . . . Thirty-Sixth Commencement
June 18. . . . Second Entrance Examination Period (principally for transfers)

September 15–16. . . . Registration
September 17. . . . Matriculation Address
September 19. . . . Opening of Courses
November 23. . . . Beginning of Thanksgiving Recess at 6:00 P.M.
November 28. . . . Resumption of Courses at 8:00 A.M.
December 17. . . . Beginning of Christmas Recess at 1:00 P.M.

1950

January 3. . . . Resumption of Courses at 8:00 A.M.
January 23–February 2. . . February Examinations

¹Beginning in 1948, the Friday, Saturday, and Monday of the Easter season have replaced the holidays formerly taken on February 22, March 2, and April 21.
EDGAR ODELL LOVETT, Ph.D., Sc.D., LL.D.
President Emeritus

OFFICERS OF ADMINISTRATION

WILLIAM VERMILLION HOUSTON, Ph.D.
President

HARRY BOYER WEISER, Ph.D.
Dean

HUGH SCOTT CAMERON, M.E.
Assistant Dean for Student Activities

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

BOARD OF TRUSTEES
HARRY CLAY HANSZEN: CHAIRMAN
GEORGE RUFUS BROWN: VICE-CHAIRMAN
HARRY CAROTHERS WIESS: VICE-CHAIRMAN
FREDERICK RICE LUMMIS: SECRETARY-TREASURER
LAMAR FLEMING, JR.
WILLIAM ALEXANDER KIRKLAND
GUS SESSIONS WORTHAM
GRADUATE

ANNOUNCEMENTS FOR 1948–1949
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. At the present time the degree of Doctor of Philosophy is awarded in the fields of mathematics, physics, chemistry, and biology. 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 published in an accredited journal or series, and a copy must be deposited in the Institute library. 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 will be awarded upon the completion of 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.

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

Graduate candidates are advised to take the Graduate Record Examination, arrangements for which may be made by writing the Graduate Record Examination, 437 West 59th Street, New York 19, N.Y. 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.
INSTRUCTIONAL STAFF

FACULTY

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

ALLGOOD, JAY R.
B.S. in M.E. (Rice) 1947
Instructor in Civil Engineering

ALSEWORTH, CHARLES C.
B.S. in M.E. (Rice) 1947
Instructor in Mechanical Engineering

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

BATTISTA, JOSEPH LLOYD
Instructor in Spanish and Italian

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

BOURGOIS, 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
Assistant Professor of French

BRAY, HUBERT EVELYN
B.A. (Tufts) 1910, M.A. (Harvard) 1916, Ph.D. (Rice) 1918
Professor of Mathematics
Brunk, Hugh Daniel
  A.B. (California) 1940, M.A. (Rice) 1942, Ph.D. (Rice) 1944
  Instructor in Mathematics

Calhoun, Harold Eugene
  B.A. (Rice) 1932
  Visiting Critic in Architecture

Calkin, John Williams
  Associate Professor of Mathematics

Camden, Charles Carroll
  A.B. (Centre College) 1925, M.A. (Iowa) 1928, Ph.D. (Iowa) 1930
  Associate Professor of English

Cameron, Hugh Scott
  M.E. (Stevens) 1925
  Assistant Professor of Mechanical Engineering and Assistant Dean for Student Activities

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
  Instructor in 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
  Associate Professor of Architecture

Craig, Hardin, Jr.
  Associate Professor of History

Davies, Joseph Ilott
  B.A. (Rice) 1928, M.A. (Rice) 1929, Ph.D. (Rice) 1937
  Assistant Professor of Biology
DeZurko, Edward R.
B.S. in Ed. (Illinois) 1939, B.S. in Arch. (Illinois) 1940, M.S. in Arch. (Columbia) 1942
Assistant Professor of Architecture

Dilworth, Harry Blackburn
A.B. (William and Mary) 1941
Instructor in English

Dix, William S.
B.A. (Virginia) 1931, M.A. (Virginia) 1932, Ph.D. (Chicago) 1946
Assistant Professor of English and Librarian

Doggett, John Rentz, Jr.
B.S. in M.E. (Rice) 1936
Instructor in Mechanical Engineering

Dunaway, James Karl
B.A. (Rice) 1936, B.S. in Arch. (Rice) 1937, M.A. (Rice) 1938, M.S. (Columbia) 1941
Assistant Professor of Architecture

Fischer, Katherine Martha
B.A. (Rice) 1944, M.A. (Rice) 1945
Instructor in 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
Assistant Professor of Philosophy

Fuson, Reynold Clayton
A.B. (Montana) 1920, A.M. (California) 1921, Ph.D. (Minnesota) 1924
Visiting Professor of Chemistry

Gallegly, Joseph S., Jr.
B.A. (Rice) 1925, M.A. (Rice) 1926
Instructor in English
GARRISON, ALLEN DARNABY
B.A. (Rice) 1918, M.S. (Rice) 1920, Ph.D. (Rice) 1921
Associate Professor of Chemical Engineering

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

GIRARD, PIERRE LÉON
Bachelier ès Lettres (Paris) 1932, Licencié ès Lettres (Paris) 1934, Diplomé d'Études supérieures (Paris) 1936, Agrégé de l'Université (Paris) 1943
Assistant Professor of French

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
Associate Professor of Physical Education

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

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

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

HUDSON, BRADFORD BENEDICT
A.B. (Stanford) 1930, Ph.D. (California) 1947
Assistant Professor of Psychology
Hudspeth, C. M.
B.A. (Rice) 1940, LL.B. (Texas) 1946
Instructor in Government

Kilpatrick, John Edgar
B.A. (Stephen F. Austin) 1940, A.M. (Kansas) 1942, Ph.D. (California) 1945
Assistant Professor of Chemistry

Landrum, Graham Gordon
B.A. (Texas) 1943, M.A. (Texas) 1948
Instructor in English

Lear, Floyd Seyward
Professor of History

Leifeste, A. A., Jr.
A.B. (Southwestern) 1934, B.S. in Arch. (Rice) 1941
Instructor in Architecture

Lewis, Arthur Orcutt, Jr.
Instructor in English

Lewis, Edward Sheldon
B.A. (California) 1940, Ph.D. (Harvard) 1947
Assistant Professor of Chemistry

Louis, Andrew
Ph.B. (Wesleyan) 1929, Ph.D. (Cornell) 1935
Assistant Professor of German

Lovett, Edgar Odell
A.B. (Bethany) 1890, M.A., Ph.D. (Virginia) 1895, Ph.D. (Leipzig) 1896, LL.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
Instructor in German
McBride, Guy T., Jr.
B.S. in Ch.E. (Texas) 1940
Assistant Professor of Chemical Engineering

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
Instructor in Physical Education

McEnany, Michael Vincent
B.S. in E.E. (Colorado College) 1929, M.A. in Physics (Dartmouth) 1931
Assistant Professor of Electrical Engineering

Mackey, William Sturges, Jr.
B.A. (Rice) 1943
Instructor in Business Administration

McKillop, Alan Dugald
Professor of English

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

MacLean, J. B.
B.A. (British Columbia) 1928, M.A. (Washington) 1935
Instructor in German

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

Mandeville, Charles Earle, Jr.
B.A. (Rice) 1940, M.A. (Rice) 1941, Ph.D. (Rice) 1943
Instructor in Physics
(On leave of absence)

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

Masterson, William Henry
B.A. (Rice) 1935, M.A. (Pennsylvania) 1946
Assistant Professor of History

Milligan, Winfred O.
Associate Professor of Chemistry

Mills, Warner Everett, Jr.
B.A. (Dartmouth) 1943
Instructor in History and Government

Money, Lloyd J.
B.S. in E.E. (Rice) 1942
Instructor in Electrical Engineering

Moraud, Marcel
Bachelier ès Lettres (Poitiers) 1907, Licencié ès Lettres (Paris) 1908, Diplômé 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
Assistant Professor of Architecture

Morledge, Joe W.
B.S. in M.E. (Rice) 1947
Instructor in Engineering

Murphy, Walter Dewitt
Instructor in Civil Engineering

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

Parish, John Edward
B.A. (Sam Houston) 1934, M.A. (Texas) 1941
Instructor in English

Pequigney, F. J.
B.A. (Notre Dame) 1944, M.A. (Minnesota) 1947
Instructor in English

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
Instructor in Electrical Engineering

Richter, George Holmes
B.A. (Rice) 1926, M.A. (Rice) 1927, Ph.D. (Rice) 1929
Professor of Chemistry

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

Ryon, Lewis Babcock
C.E. (Lehigh) 1917
Professor of Civil Engineering

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

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

Sims, James Redding
B.S. in C.E. (Rice) 1941
Assistant Professor of Civil Engineering
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
Assistant Professor of Physics

Talmage, Roy V.
A.B. (Maryville College) 1938, M.A. (Richmond) 1940, Ph.D. (Harvard) 1947
Instructor in Biology

Tesoro, Robert
B.S. in Ch.E. (Rice) 1945, S.M. in Ch.E. (M.I.T.) 1948
Instructor in Chemical Engineering

Thomas, Joseph David
Ph.B. (Chicago) 1929, A.M. (Chicago) 1930
Assistant Professor of English and Assistant Registrar

Tsanoff, Radoslav Andrea
B.A. (Oberlin) 1906, Ph.D. (Cornell) 1910
Professor of Philosophy

Ulrich, Floyd Edward
Associate Professor of Mathematics

Warren, Richard Hardin
B.S. (Haverford) 1943
Instructor in English

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

WEISER, HARRY BOYER
B.A. (Ohio State) 1911, M.A. (Ohio State) 1912, Ph.D. (Cornell) 1914
Professor of Chemistry and Dean

WELD, HARRY PORTER
Ph.B. (Ohio State) 1900, Ph.D. (Clark) 1911
Visiting Professor of Psychology

WELSH, HUGH CLAYTON
M.D. (Texas) 1923
Instructor in Biology

WHITING, GEORGE WESLEY
A.B. (West Virginia) 1908, A.M. (Harvard) 1913, Ph.D. (Chicago) 1926
Associate 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
Assistant 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
INSTRUCTIONAL STAFF

Young, Homer Harry
B.A. (Austin College) 1930, M.A. (Southern Methodist) 1937
Instructor in Education

ASSISTANTS AND FELLOWS

(Previous degrees of fellows indicated to April, 1948)

Albanese, Philip
B.S. in E.E. (Rice) 1940
Assistant in Mechanical Engineering

Badger, Algernon Sidney
Fellow in Electrical Engineering

Bame, Samuel Jarvis, Jr.
B.Sci. in Physics (North Carolina) 1947
Fellow in Physics

Banewicz, John Joseph
Sc.B. in Chem. (Brown) 1944
Fellow in Chemistry

Barrett, John Harold
Fellow in Physics

Baumgarten, Henry Ernest
B.A. (Rice) 1943, M.A. (Rice) 1944
Humble Fellow in Chemistry

Beck, J. Walter
B.S. (Pennsylvania State) 1936
Fellow in Biology

Bell, Robert William
B.S. in Ch.E. (Rice) 1946
Fellow in Chemical Engineering

Berry, Virgil Jennings, Jr.
Fellow in Chemical Engineering

Besdin, David Jacob
B.S. (Miami) 1946, M.A. (Rice) 1947
Fellow in Physics
THE RICE INSTITUTE

Bischel, Kenneth H.
B.S. in Ch.E. (South Dakota School of Mines) 1947
Shell Fellow in Chemical Engineering

Blackstock, Albert William
Fellow in Physics

Blunt, Robert Francis
B.A. (Rice) 1943, M.A. (Rice) 1947
Socony-Vacuum Fellow in Physics

Bott, Lawrence L.
B.S. (Illinois) 1947
Fellow in Chemistry

Burke, William Henry, Jr.
Fellow in Physics

Bushey, Gordon Lake
B.S. in Ch.E. (Rice) 1943, M.A. (Rice) 1944
Procter and Gamble Fellow in Chemistry

Butler, James Wilford
B.S. in Ch.E. (Georgia Tech.) 1944
Fellow in Physics

Cecil, Olin B.
Fellow in Chemistry

Conner, Jerry Power
Fellow in Physics

Costa, Phillip B.
B.S. in Ph. Ed. (Rice) 1947
Assistant in Physical Education

Darnell, Rezneat Milton, Jr.
B.S. (Southwestern at Memphis) 1946
Fellow in Biology

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

De la Garza, Rodolfo
B.S. in E.E. (Rice) 1947
Fellow in Electrical Engineering
DRAPER, ARTHUR LINCOLN, JR.
   Procter and Gamble Fellow in Chemistry

DVORETZKY, ISAAC
   Fellow in Chemistry

ECKEL, JOHN RAYMOND
   B.S. in E.E. (Rice) 1944
   Fellow in Electrical Engineering

EIMERL, SAREL HENRY
   Assistant in History

ELDER, LORENE CATHERINE
   Fellow in English

EVANS, JOHN ELLIS
   B.A., B.S. in Ed. (Ohio State) 1936, M.A. (Ohio State) 1937,
   Ph.D. (Rice) 1947
   Research Fellow in Physics

FARISS, ROBERT ELWYN
   B.S. (Rice) 1942
   Fellow in Chemistry

FROST, ROBERT CARLTON
   Fellow in Biology

GOFREY, NORMAN BELL
   B.S. (California) 1946
   Humble Fellow in Chemistry

GRAHAM, JOHN WAYNE
   Fellow in Mathematics

GRININGER, DONN ROBERT
   Fellow in Electrical Engineering

HARRIS, JAMES COLWELL
   B.A. (Rice) 1942, M.A. (Rice) 1944
   Humble Fellow in Physics

HAY, WALLACE SIMPSON
   Sc.B. in Chem. (Brown) 1943
   Fellow in Chemistry

HOOP, MILDRED CLAIRE
   Fellow in Romance Languages
HUNSAKER, Neville Carter  
B.A. (Utah) 1930, M.A. (California) 1932  
Fellow in Mathematics

JAMES, Jesse Clopton  
Fellow in Physics

JOHNSON, Burnett Hood  
B.S. (Sam Houston) 1944  
Fellow in Chemistry

Jonsson, Suzanne  
B.A. (Rice) 1946  
Fellow in History

KILGORE, Charles Hugh  
Fellow in Chemical Engineering

LANDUA, Alton John  
B.S. (Texas A. and M.) 1942  
Fellow in Chemistry

Lillie, Alan Bentley  
B.Sc. (Queen's) 1946  
Fellow in Physics

Lin Chuan  
Fellow in Civil Engineering

Linam, Paul Audrey  
B.S. (Calif. Inst. of Tech.) 1947  
Fellow in Chemical Engineering

Lindsay, Robert  
Sc.B. in Physics (Brown) 1947  
Fellow in Physics

Livingston, H. Raymond  
Fellow in Electrical Engineering

Love, William Freeman  
B.S. (Rice) 1945, M.A. (Rice) 1947  
Fellow in Physics
INSTRUCTIONAL STAFF

McAtee, James Lee, Jr.
B.S. (Texas A. and M.) 1947
Fellow in Chemistry

McCall, Mildred
B.A. (Rice) 1946
Fellow in History

Merrifield, Paul E.
A.B. (Colby) 1947
Fellow in Chemistry

Merseburger, Marion Doris
Fellow in History

Miller, Emery Bernlee
B.S. (Illinois) 1947
Fellow in Chemistry

Miller, John William
B.S. in E.E. (Rice) 1946
Fellow in Electrical Engineering

Miller, Lee Wells
A.B. (Cedarville College) 1942
Fellow in English

Morgan, Chester Stephen, Jr.
B.S. in Ch.E. (Rice) 1944
Humble Fellow in Chemistry

Mut, Stuart Creighton
B.S. in E.E. (Rice) 1947
Fellow in Electrical Engineering

Overton, William Calvin, Jr.
B.S. (North Texas) 1941
Fellow in Physics

Pearson, Angus George
B.A. (Texas) 1938
Socony-Vacuum Fellow in Physics

Phillips, Gerald Cleveland
B.A. (Rice) 1944, M.A. (Rice) 1947
Humble Fellow in Physics
Plumbley, John A.
   Assistant in Physical Education

Pollard, Mary Alice
   Fellow in History

Pry, Robert H.
   B.A. (Texas A. and I.) 1947
   Fellow in Physics

Randall, Royal William, Jr.
   B.A. (Rice) 1944
   Fellow in Physics

Read, Clark P., Jr.
   Fellow in Biology

Richardson, Jasper Edgar
   B.S. (Yale) 1944
   Fellow in Physics

Schmitt, Roland Walter
   B.A., B.S. in Phys. (Texas) 1947
   Fellow in Physics

Skomal, Edward Nelson
   B.A. (Rice) 1947
   Fellow in Physics

Smith, Ralph Burns
   B.A. (Ohio State) 1947
   Fellow in History

Stousland, Charles Eugene, Jr.
   A.B. (William and Mary) 1941, B.Arch. (Yale) 1947
   Fellow in Architecture

Strickler, Walter Roy
   B.S. (S.L.I.) 1944
   Fellow in Mathematics

Summers, Joseph Franklin
   B.A. (Houston) 1942, M.A. (Texas) 1947
   Fellow in Mathematics
INSTRUCTIONAL STAFF

Swinford, Lauralee Redfield
B.A. (Rice) 1946
Fellow in Biology

Talmage, Helena S.
A.B. (Wilson College) 1941
Assistant in Biology

Taylor, Howard Edward
B.A. (Rice) 1942, M.S. (Calif. Inst. of Tech.) 1943
Assistant in Mathematics

Terrell, Nelson James, Jr.
B.A. (Rice) 1944, M.A. (Rice) 1947
Fellow in Physics

Vernon, Lonnie William
Fellow in Chemistry

Vondy, Elizabeth Carol
B.A. (Rice) 1946
Fellow in English

Whaling, Ward
B.A. (Rice) 1944, M.A. (Rice) 1947
Fellow in Physics

White, Thomas Jefferson
B.A. (Rice) 1940
Assistant in Mathematics

Whitehurst, Harry Bernard
B.A. (Rice) 1944
Humble Fellow in Chemistry

Wojecki, Edward J.
B.S. (Louisiana Tech.) 1936
Assistant in Physical Education

Zuefledt, Richard Daniel
B.S. in E.E. (Rice) 1946
Fellow in Electrical Engineering
FACULTY COMMITTEES

The President is a member, ex officio, of all committees.

Committee on Admissions: Mr. McCann, chairman; Messrs. Dunaway, Garrison, Lear, Ryon, Thomas, and Ulrich.

Committee on Graduate Instruction: Mr. Houston, chairman; Messrs. Bonner, Bray, Chandler, Tsanoff, Weiser, and Wischmeyer.

Committee on Examinations and Standing: Mr. Ryon, chairman; Messrs. Craig, McEnany, Morehead, and Richter.

Committee on Schedules: Mr. McCann, chairman; Messrs. Calkin, Camden, Hartsook, J. Hodges, Nicholas, and Risser.

Committee on the Library: Mr. Heaps, chairman; Messrs. Chandler, Chillman, McKillop, and Tsanoff.

Committee on Student Activities: The Assistant Dean for Student Activities, ex officio, chairman; Messrs. Davies, Dix, Gallegly, Hermance, Shelton, and J. Smith; 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 Grounds and Buildings: Mr. Watkin, chairman; Messrs. Hartsook, Milligan, Sims, and Waters.

Committee on Publications: Mr. Thomas, chairman; Messrs. Louis, Moraud, Simons, Whiting, and Williams.

Committee on Public Lectures: Mr. Fulton, chairman; Messrs. Altenburg, Bonner, Bourgeois, and Milligan.

Committee on Outdoor Sports: Mr. Bray, chairman; Messrs. Hermance and Nicholas; representatives of the R Association: Messrs. J. Eric Beall and Frank Power, Jr.

Navy Committee: Mr. Ryon, chairman; the Professor of Naval Science; Messrs. Craig, Hermance, McCann, McEnany, and Weiser.

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

Executive Committee: The President, ex officio, chairman; the Dean; Messrs. McKillop, Richter, and Waters.
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

Registration fee .................................. $25.00
   (An annual fee required of all students.)
Library fee ........................................ 25.00
   (An annual fee required of all students.)
Late registration fee ............................... 5.00
Examination fee .................................... 5.00
   (A fee to cover the cost of examinations and transcripts.)
Diploma fee ......................................... 5.50
   (A fee required of all candidates for degrees.)
Blanket-tax .......................................... 9.60
   (An annual charge for student activities.)

Health Service fee

Dormitory residents ................................ 10.00
Town students ...................................... 5.00

Gymnasium fee

Every male student pays this fee for the use of gymnasium equipment during his undergraduate residence. The fee is paid once only by a student entering as a

Freshman ........................................... 16.00
Sophomore .......................................... 12.00
Junior .............................................. 8.00
Senior .............................................. 4.00
Graduates (Annual charge, optional) ............ 4.00
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EXPENSES

440, 510, 520, 530............... $25.00
500, 550....................... 50.00

ARCHITECTURE (Every student enrolled in the department.) 30.00
ARCHITECTURE 210, 310, 410, or 450, if taken alone..... 15.00

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.

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. Until November first, a blanket-charge of approximately one dollar and sixty cents per day will be made. 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 Assistant Dean for Student Activities.

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 and other forms of recreation, under the supervision of Miss Sarah Louise Lane, B.A. (Rice), B.S. in Library Service (Columbia), Adviser to Women. Information concerning desirable places of residence for young women students may be had from Miss Lane.
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 regarding the facilities and care can be secured at the Office of the Health Service (reached by the east entrance of West Hall).
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. In addition, a number of teaching fellowships are available.

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

Under the will of Mrs. Ora Nixon Arnold there was established in 1936 a fund to assist in securing a better understanding between the people and governments of Mexico, the South American States, the West Indies, and the Philippine Islands. The income is to be used in financing traveling fellowships to be allotted to graduates of the Rice Institute of outstanding ability and character, or to a graduate of the University of Mexico of equal distinction.

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
STIPENDS AND FUNDS

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 FELLOWSHIP OR SCHOLARSHIP

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 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 SOCONY-VACUUM FELLOWSHIP

The Socony-Vacuum Oil 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 CHEMICAL ENGINEERING

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

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.

THE RICE INSTITUTE FELLOWSHIPS

The Rice Institute provides a number of fellowships for graduate students which carry stipends up to $1000 per year and exemption from all fees. A graduate fellow is expected to do a small amount of teaching, which provides him valuable training both in the subject matter of his specialty and in preparation for an academic career. Students holding fellowships ordinarily plan to spend a minimum of four years preparing for the degree of Doctor of Philosophy.

ASSISTANTSHIPS

A certain number of persons with outstanding qualifications may be appointed as assistants in the various departments of the Rice Institute. These assistants will be expected to carry a teaching load comparable with and, in general, somewhat less than that carried by instructors, but they will be permitted to work toward an advanced degree. In general, assistants will be able to do only about half-time graduate study.

Persons interested in being considered for appointment as assistants should communicate with one of the professors in the department concerned.
GRADUATE WORK IN
MATHEMATICS

Professors: H. E. Bray, S. Mandelbrojt
Associate Professors: J. W. Calkin, F. E. Ulrich
Assistant Professor: G. R. MacLane
Instructor: H. D. Brunk

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 fellowships that call for a small amount of teaching.

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 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 contribu-
tion 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 passing of an oral examination given by the faculty.

In order that they may obtain adequate experience in collegiate teaching, students holding fellowships 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.

Mr. Calkin

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.

(Not offered in 1948-49)
Mathematics 420. *Infinite Processes.* Sequences, series, Stieltjes integrals, summability, and related topics. Three lectures per week.

*Mr. Brunk*

Mathematics 430. *Modern Geometry.* Synthetic and algebraic geometry, theory of groups, invariants, etc. Three lectures per week.

(Not offered in 1948-49)


*Mr. Mandelbrojt*


*Mr. Calkin*


*Mr. Bray*


*Mr. Bray*
**Mathematics 530. Laplace Transforms.** Applications to the solution of differential systems. Three lectures per week.

*Mr. Ulrich*


*Mr. Calkin* (Not offered in 1948-49)

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

*Mr. Ulrich*

**Mathematics 560. Analytic Continuation and Infinitely Differentiable Functions.** 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.

*Mr. Mandelbrojt*


*Mr. Mandelbrojt*


*Mr. Calkin* (Not offered in 1948-49)

**Mathematics 570. Analytical Theory of Numbers.** General theory of Dirichlet series. The Riemann zeta function. Study of various functions of number theory, Euler-Mangoldt function,
Möbius-Landau functions. Theorems of Hadamard and de la Vallée Poussin on the number of prime numbers less than a given number. Three lectures per week.

(Not offered in 1948–49)


Mr. Brunk


(Not offered in 1948–49)

Applied Mathematics 500a. 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.

Mr. Calkin

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
Assistant Professors: J. R. Risser, C. F. Squire

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. 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.

The physics laboratories contain ten 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.

Two small 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, electroscopes, and radioactive sources.

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 dark-rooms 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

**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.

**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*


**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 590. Research Work.
GRADUATE WORK IN CHEMISTRY

Professors: A. J. Hartsook, G. H. Richter, H. B. Weiser
Visiting Professor: R. C. Fuson
Associate Professors: A. D. Garrison, W. O. Milligan,
H. O. Nicholas
Assistant Professors: W. W. Akers, J. E. Kilpatrick, E. S. Lewis,
G. T. McBride, J. T. Smith

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.

A candidate for the degree of Master of Arts must elect a principal subject and arrange a schedule which represents the equivalent of four advanced courses to be passed with high credit. The work 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 the principal subject. In addition, the candidate for the master's degree is required to pass a public oral examination.

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

In addition to the general requirements outlined above, the following specific requirements must be met by candidates for advanced degrees taking their major work in chemistry:

For admission to full graduate standing, candidates for advanced degrees must possess a reading knowledge of scientific German; and must have completed general courses equivalent to those of the Rice Institute in Inorganic Chemistry and Qualitative Analysis, Quantitative Analysis, Organic Chemistry, and Physical Chemistry, and at least one full-year course of more advanced
work equivalent to corresponding Senior work in chemistry of the Rice Institute. Preference will be given to applicants who earn high scores on the Graduate Record Examination, including the advanced test in chemistry. (See page 2.) A new graduate student who has not taken the Graduate Record Examination will be required to do so at the earliest examination time during his first semester of residence.

A candidate for the degree of Master of Arts is required to complete, in addition to a thesis, two full-year courses in chemistry, one of which must be a 500 course; and one approved 300 or 400 course in mathematics, physics, or biology. The first week in May of the last year of residence, the candidate will be given three-hour written examinations in general chemistry and organic chemistry, and must pass also a final public oral examination.

A candidate for the degree of Doctor of Philosophy is required to complete, in addition to a thesis, a minimum of four full-year graduate courses in chemistry, and one advanced course in mathematics, physics, or biology. He must satisfy the members of the staff under whom he is working that he possesses a reading knowledge of scientific French as well as scientific German. The first week in May of the last year of residence, the candidate will be given comprehensive written examinations covering the main branches of chemistry, with special emphasis on the branch in which the candidate is working, and in addition must pass a final public oral examination.

Courses in Chemistry

Chemistry 410. *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. Weiser*

Chemistry 420. *Advanced Physical Chemistry.* Two lectures and one conference on problems weekly during the second half-
year. Structure of matter, methods in physical chemistry, phase rule, X-ray and electron diffraction analysis, electro- and optical methods.

Mr. Milligan

Chemistry 430. Advanced Inorganic Qualitative Analysis. Two lectures and four hours of laboratory work weekly during the second half-year. The course includes the application of organic reagents for the identification of metallic ions, and a study of the detection of some of the less familiar elements. Prerequisite: Physical Chemistry.

Mr. Nicholas

Chemistry 440. 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.

Mr. Richter

Chemistry 450. Advanced Quantitative Analysis. Two lectures and six hours of laboratory work weekly during the first half-year. A study of advanced topics in quantitative analysis with emphasis on recent methods. The laboratory work includes examples of the types of analyses covered in the lectures. Prerequisites: Organic Chemistry and Physical Chemistry.

Mr. Nicholas

Chemistry 480. Chemical Literature. One lecture weekly during the first half-year. The course is devoted to a 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.

Mr. Richter (Not offered in 1948–49)

Chemical Engineering 405. Unit Operations. Three lectures and six hours of laboratory work 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: heat transmission; evaporation; humidification and dehumidification; air conditioning; drying; distillation and fractionation; filtration; absorption and adsorption; extraction; crystallization; crushing; grinding; separation; agitation; transportation of solids, liquids, and gases; water softening; corrosion and water treatment for boiler use; pyrometry; etc. The laboratory work consists of experimental studies of the various types of unit operations equipment from the standpoint of operation, testing, and theory. Prerequisite: Junior Chemical Engineering.

Mr. Hartsook

Chemical Engineering 425a. Chemical Engineering Thermodynamics. Three hours of lectures weekly during the first half-year. A course in theoretical and applied thermodynamics. Prerequisite: Physical Chemistry.

Mr. Garrison

Chemical Engineering 425b. Chemical Engineering Thermodynamics. Three hours of lectures weekly during the second half-year. A continuation of theoretical and applied thermodynamics. Prerequisite: Chemical Engineering 425a.

Mr. Garrison

Chemistry 500. M.A. Thesis. The program of the department permits a student to take the degree of Master of Arts after the successful completion of one or two years of graduate work. Students who elect to take the degree of Master of Arts are required to prepare a thesis, under the direction of some member of the staff of instruction.

Chemistry 510. Adsorption. Three lectures or conferences weekly during the second half-year. A course in advanced colloid chemistry dealing with the nature and mechanism of adsorption and its relation to such phenomena, among others, as the stability of colloidal systems and contact catalysis.

Mr. Weiser
Chemistry 520. Theory of Valence. Three lectures weekly during the second half-year. A consideration of inter-atomic forces and their relationship to the structure and properties of matter. (Alternates with Chemistry 530.)

Mr. Smith

Chemistry 530. 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. (Alternates with Chemistry 520.)

Mr. Smith (Not offered in 1948–49)

Chemistry 540. 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, among others, as tautomerism, geometrical and optical isomerism, and the chemistry of carbohydrates. (Alternates with Chemistry 560.)

Mr. Richter


Mr. Fuson

Chemistry 550. Microchemical Analysis. One lecture and six hours of laboratory work weekly during the first half-year. A course in quantitative micro-analysis based on the procedures of Fritz Pregl. Prerequisite: Chemistry 440.

Mr. Richter

Chemistry 560. Advanced Physiological Chemistry. Two lectures weekly during the first half-year. The course is open only to graduate students who have some knowledge of the fundamentals of physiological chemistry. The course deals with the chemistry of blood, respiration, urine, energy metabolism, and the endocrines. (Alternates with Chemistry 540.)

Mr. Nicholas (Not offered in 1948–49)

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. Prerequisite: Satisfactory completion of the Graduate Record Examination.


Mr. Milligan

Chemistry 620. Advanced Inorganic Chemistry. Two lectures weekly and a seminar fortnightly. A study of the chemical elements and their compounds from the standpoint of the periodic law. Modern developments in inorganic chemistry will receive special attention.

Mr. Smith (Not offered in 1948–49)

Chemistry 630. Thermodynamics. Three lectures weekly. Relation of heat and work to chemical and physical systems. A detailed consideration of free energy, entropy, and fugacity as applied to equilibria. During the second semester the basic concepts of thermodynamics are developed from the principles of statistical mechanics. Relation of thermodynamic properties to molecular structure.

Mr. Kilpatrick (Not offered in 1948–49)

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

Mr. Richter (Not offered in 1948–49)

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
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, and endocrinology.

The department is well equipped with the usual apparatus and supplies for work in general biology, physiology, bacteriology, and microscopic technique, and is prepared to obtain reasonable quantities of special apparatus or supplies which may be needed in connection with particular research 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, and immunology. 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. Upper-class courses are given in alternate years in order to give the students a wider range of subjects.

There are no formal graduate courses, but special courses in a wide range of subjects are arranged 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. Such courses have been given in the past in medical entomology, general entomology, helminthology, protozoology, invertebrate zoology, ichthyology, herpetology, ornithology, endocrinology, genetics, and others. Such courses are usually based on eight semester hours a
year as in the case of the regularly scheduled laboratory science courses. About three hours of laboratory or field work counts as the equivalent of one hour of lecture, recitation, or library work.

The research is done on the same basis, some students taking the equivalent of one, some of two, eight-semester-hour courses, according to the time put in. Most students take advanced courses in the chemistry department also, and sometimes in other departments.

As a rule only graduate students planning to work for the degree of Doctor of Philosophy are accepted, although a degree of Master of Arts is usually given as a preliminary. In this department only research master's degrees are given since neither time nor space is available for the teacher's master's degree, consisting of a year of advanced study in a specialized field, as given by some universities.

For students who are doing part-time assisting on a fellowship, a minimum of two years is required for the master's degree and a total of four years for the doctor's degree. In their assisting work, as far as it is feasible, fellows are permitted to assist with different courses in different years to obtain as much teaching background as possible.
GRADUATE WORK IN THE HUMANITIES

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: English, German, history, philosophy, 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 limited number of fellowships are available for students of marked promise.

A minimum of one year of graduate study is required for the degree of Master of Arts. A candidate for this degree must elect a principal subject and arrange a schedule which represents the equivalent of four advanced courses, to be passed with high credit. The work 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 the principal subject. The candidate must also pass a public oral examination given by the faculty. In addition to the general requirements here outlined, other specific requirements may be imposed by the various departments.
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 a fellowship requiring some teaching or other service.

Requirements for the Degree of Master of Science in Chemical Engineering

(1) Advanced Topics in Chemical Engineering (Ch.E. 505)
(2) Research and Thesis (Ch.E. 575)
(3) Approved elective in mathematics, physics, chemistry, or engineering
(4) Chemical Process Design (Ch.E. 525a) (first half-year)
Petroleum Production Engineering (Ch.E. 525b) (second half-year)
(5) Seminar (Ch.E. 485) (second half-year)

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)

Requirements for the Degree of Master of Science in Electrical Engineering

(1) Advanced Circuit Analysis (E.E. 500)
(2) Research and Thesis (E.E. 510)
(3) Advanced Electrical Power Engineering (E.E. 520), or
Advanced Communications Engineering (E.E. 540)
(4) Approved elective in mathematics, physics, or engineering
(5) Approved elective

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)

Courses in Engineering

Chemical Engineering 485. 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. This course is required of all chemical engineers.

Mr. Akers
Chemical Engineering 505. *Advanced Topics in Chemical Engineering.* Three lectures weekly. An advanced study of the principles of chemical engineering. The first half-year will include fluid flow, heat transfer, evaporation, filtration, and sedimentation. The second half-year will include the mass transfer operations—distillation, absorption, drying, extraction, and leaching. Special emphasis will be placed upon the application of theoretical principles to chemical engineering practices. Prerequisite: Chemical Engineering 405. (See page 41.)

*Mr. McBride*

Chemical Engineering 525a. *Chemical Process Design.* Three lectures weekly during the first half-year. The application of thermodynamics and unit operations to the design of chemical equipment and plants. Prerequisites: Chemical Engineering 405 and 425a and b. (See pages 41–42.)

*Mr. Akers*

Chemical Engineering 525b. *Petroleum Production Engineering.* Three lectures weekly during the second half-year. A study of the problems encountered in the production of petroleum, including the calculation of oil and gas reserves and the process design of separating and cycling plants. Prerequisites: Chemical Engineering 405 and 425a and b. (See pages 41–42.)

*Mr. Akers*

Chemical Engineering 575. *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. Two copies of the accepted report will be required for deposit in the Institute library.

Civil Engineering 465. *Elementary Structural Design.* Three lectures and one laboratory period weekly.

*Mr. Murphy*

Civil Engineering 500. *Structural Design.* Design of steel office and mill buildings. Analysis of stresses in statically indeterminate structures such as swing, cantilever, arch, and suspension bridges.
A study of secondary stresses. Three lectures and two laboratory periods weekly. Prerequisite: Steel and Timber Structures.

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

**Civil Engineering 510.** *Soil Mechanics and Foundations.* Three lectures and one laboratory period weekly. Prerequisites: Municipal Engineering, and Concrete Structures.

**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 two complete typewritten or printed reports will be required for deposit in the Institute library.

*Mr. Ryon*

**Electrical Engineering 500.** *Advanced Circuit Analysis.* Non-linear circuits; three- and four-winding transformer theory; transmission networks; machine and circuit transients; transient stability. Three lectures and four hours of laboratory work weekly.

*Mr. McEnany*

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

**Electrical Engineering 510.** *Research and Thesis.* A thorough report on an electrical engineering investigation selected and carried out by the individual student. Two copies of the accepted report will be required for deposit in the Institute library. Nine hours of research weekly.

*Mr. Waters*

**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.

*Mr. Pfeiffer*

**Electrical Engineering 540.** *Advanced Communications Engineering.* Electromagnetic theory and wave propagation; micro-
waves; electro-acoustical systems. Three lectures and four hours of laboratory work weekly.

Mr. Wischmeyer

**Mechanical Engineering 500.** *Advanced Strength of Materials, Kinematics, and Machine Design.* Analytical and graphical analyses are applied to problems of stress concentrations, of balance and vibration, and of stress due to dynamical causes. The mechanical properties of metals are emphasized in problems involving fatigue, high temperatures, strain, hardening, etc. Prerequisites: Mechanical and Machine Design, and Materials and Metallurgy.

(Not offered in 1948-49)

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

**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 530.** *Advanced Internal-combustion Engines.* Study of combustion, dynamics, and performance of internal-combustion engines for stationary and vehicular applications. Three lectures weekly for one semester.

Mr. Cameron

**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. Two copies of the accepted report will be required for deposit in the Institute library.
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. 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. DeZurko, Dunaway, and Watkin
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 DeZurko*

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. Dunaway and Morehead*
<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Department</th>
<th>Thesis Title</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>
</tr>
<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 transformaions.</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>
</tr>
<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></td>
<td>John Jay Gergen</td>
<td>Mathematics</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</td>
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<tr>
<td>YEAR</td>
<td>NAME</td>
<td>DEPARTMENT</td>
<td>PROJECT</td>
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<td>1929</td>
<td>Nat Edmonson, Jr.</td>
<td>Mathematics</td>
<td>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>
</tr>
<tr>
<td></td>
<td>Deborah May Hickey</td>
<td>Mathematics</td>
<td>Poisson's integral and plurisegments on the hypersphere.</td>
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<tr>
<td></td>
<td>Edward Roy Cecil Miles</td>
<td>Mathematics</td>
<td>A three-dimensional treatment of groups of linear transformations.</td>
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<td></td>
<td>Ray Nelson Haskell</td>
<td>Mathematics</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>
<td>The atomic weights of chlorine and vanadium.</td>
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<td></td>
<td>Charles Hewitt Dix</td>
<td>Mathematics</td>
<td>Lattice regions and their application in dynamics.</td>
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<td></td>
<td>Paul Duane Harwood</td>
<td>Biology</td>
<td>The helminths parasitic in the Amphibia and Reptilia of Houston, Texas, and vicinity.</td>
</tr>
<tr>
<td></td>
<td>William Monroe Rust, Jr.</td>
<td>Mathematics</td>
<td>Integral equations and the cooling problem for several media.</td>
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<td>1932</td>
<td>Henry Eugene Banta</td>
<td>Physics</td>
<td>Some thermo- and galvanomagnetic properties of a bismuth crystal.</td>
</tr>
<tr>
<td></td>
<td>Gordon Lee Locher</td>
<td>Physics</td>
<td>I. The compound photoelectric effect of X-rays in light elements. II. Attempts to induce radioactivity in matter. III. A photoelectric Geiger</td>
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<tr>
<td>Year</td>
<td>Name</td>
<td>Department</td>
<td>Thesis Title</td>
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<tr>
<td>1933</td>
<td>John Henry Binney</td>
<td>Mathematics</td>
<td>An elliptic system of integral equations on summable functions.</td>
</tr>
<tr>
<td></td>
<td>Albert Grant Mallison</td>
<td>History</td>
<td>Early history of the office of the Attorney General of the United States.</td>
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<td></td>
<td>John Virgil Pennington</td>
<td>Physics</td>
<td>A theory of imperfect elasticity.</td>
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<tr>
<td></td>
<td>Paul Klein Rees</td>
<td>Mathematics</td>
<td>The transforms of Fuchsian groups.</td>
</tr>
<tr>
<td>1934</td>
<td>Tom Wilkerson Bonner</td>
<td>Physics</td>
<td>I. Collisions of neutrons with atomic nuclei.</td>
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<td></td>
<td>II. The energy distribution of the neutrons from fluorine.</td>
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<td></td>
<td>III. The energy distribution of neutrons from boron.</td>
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<td></td>
<td>IV. Emission of neutrons from fluorine and beryllium.</td>
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<td>V. Ionization of gases by neutrons.</td>
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<tr>
<td></td>
<td>George Robert Gray</td>
<td>Chemistry</td>
<td>Hydrogen ion displacement during the coagulation of arsenic trisulfide sol and sulfur sol.</td>
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<tr>
<td></td>
<td>Homer Clarence Matthes</td>
<td>Biology</td>
<td>A study of the seasonal distribution of Anopheles in Houston, Texas.</td>
</tr>
<tr>
<td></td>
<td>Winfred O. Milligan</td>
<td>Chemistry</td>
<td>X-ray studies on the hydrous oxides.</td>
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<td></td>
<td>Frances Douglas Ward</td>
<td>Biology</td>
<td>The production of mutations in <em>Drosophila melanogaster</em> by irradiation with alpha-rays.</td>
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<tr>
<td>1935</td>
<td>Paul Livingston Burlingame</td>
<td>Biology</td>
<td>On the environmental nature of resistance in the albino rat to single and superimposed infestations with an acanthocephalan (<em>Moniliformis moniliformis</em>).</td>
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<tr>
<td></td>
<td>George Alvin Garrett</td>
<td>Mathematics</td>
<td>Necessary and sufficient conditions for potentials of single and double layers.</td>
</tr>
<tr>
<td></td>
<td>John Tom Hurt</td>
<td>Mathematics</td>
<td>On the uniformly bounded turning of level curves of the Green's function.</td>
</tr>
<tr>
<td>Year</td>
<td>Name</td>
<td>Department</td>
<td>Research</td>
</tr>
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<td>1936</td>
<td>Joseph Williams Hahn</td>
<td>Mathematics</td>
<td>Projective transformations in two complex variables.</td>
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<td></td>
<td>Hughes Mead Zenor</td>
<td>Physics</td>
<td>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.</td>
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<td>1937</td>
<td>Joseph Ilott Davies</td>
<td>Biology</td>
<td>Studies on the behavior of transplanted ovaries and a suggested hypothesis as to the interrelations of the various cellular elements of the ovary.</td>
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<td></td>
<td>Frank House Hurley, Jr.</td>
<td>Chemistry</td>
<td>The atomic weight of carbon: the ratio of benzoyl chloride to silver.</td>
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<td></td>
<td>Ernest Carlton Kennedy</td>
<td>Mathematics</td>
<td>Fuchsian groups of genus two.</td>
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<td>1938</td>
<td>Walter Tandy Scott</td>
<td>Mathematics</td>
<td>On continued fractions and infinite products.</td>
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<td>1939</td>
<td>William Joseph Coppoc</td>
<td>Chemistry</td>
<td>The constitution of the alleged Thiessen hydrates from isothermal dehydration.</td>
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<td>Julian Frank Evans</td>
<td>Physics</td>
<td>Examination of additively colored alkali halides for photoelectric Hall effect.</td>
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<td>Eby Nell McElrath</td>
<td>Chemistry</td>
<td>Studies on the alkyldioxynaphthalene-carboxylic acid derivatives.</td>
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<td>Fred Terry Rogers, Jr.</td>
<td>Physics</td>
<td>An independent determination of the binding energy of the deuteron.</td>
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1940

Emmett Leroy Hudspeth
Physics
I. Anomalous scattering of neutrons by helium and the d-d neutron spectrum. II. Electroscope investigation of the anomalous scattering of neutrons by helium. III. Resonances in the disintegration of carbon by deuterons. IV. Observation of H² and H³ ranges from the disintegration of deuterium by deuterons. V. Low energy neutrons from the deuteron-deuteron reaction.

John Purcell Nash
Mathematics
A class of continuous functions and convergence criteria for their Fourier series.

Maxwell Ossian Reade
Mathematics
Generalizations to space of the Cauchy and Morera theorems.

Marguerite Moilliet Rogers
Physics
A determination of the masses and velocities of three radium B beta-particles.

Vernon Truett Schuhardt
Biology
Studies of the Falls Creek (Texas) strain of relapsing fever spirochetes.

Karl Cornelius ten Brink
Chemistry
Adsorption studies on clays.

1941

James Douglas Bankier
Mathematics
Arithmetical continued fractions.

John Bertram Bates
Chemistry
X-ray diffraction studies on heavy metal iron-cyanides.

James Fred Denton, Jr.
Biology
Studies on the morphology, taxonomy, and life histories of trematodes of the subfamily Dicrocoeliinae Looss, 1899.

Henry Francis Dunlap
Physics
The scattering of fast neutrons by lead.

Price Bush Elkin
Chemistry
Adsorption studies on clays.

James Holmes
Chemistry
The constitution of silica gel.

James Curtiss Schiller
Chemistry
A study of the bromination of saturated organic compounds.

1942

Nat Huyler Marsh
Chemistry
A study of cracked gasoline and the reaction of bromine with primary aliphatic alcohols.

Donald Vincent Moore
Biology
Studies on the life history and development of certain Acanthocephala of the order Archiacanthocephala (Meyer, 1931).
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Year    Name                        Department

1943    Hugh Taylor Richards       Physics
Transmutations of lithium by deuterons.

1943    Robert Narvaez Little, Jr.  Physics
Neutron scattering by magnesium.

1943    Charles Earle Mandeville, Jr. Physics
The energies of some nuclear gamma-rays.

1943    George Piranian            Mathematics
A study of the position and nature of the singularities of functions given by their Taylor series.

1943    Wolfgang Joseph Thron      Mathematics
Convergence regions for continued fractions.

1943    Charles Earle Mandeville, Jr. Physics
The energies of some nuclear gamma-rays.

1944    Vincent Frederick Cowling  Mathematics
(Oct.) On functions defined by a Taylor series.

1944    Thomas Percy Wier, Jr.     Chemistry
The electrodeposition of aluminium.

1944    Hugh Daniel Brunk          Mathematics
(Feb.) Some generalizations for Dirichlet's series of Hadamard's theorem with applications.

1944    Charles Sedwick Matthews   Chemistry
A study of alumina-silica-fluorine combinations as hydrocarbon conversion catalysts.

1944    Warren Candler Simpson     Chemistry
Electron diffraction studies on alumina films.

1945    Clarence John Addis, Jr.   Biology
(June) I. Factors influencing the growth of tapeworms (Hymenolepis diminuta).
II. Studies on the sandflies of Texas (Phlebotomus).

1945    Robert Warren Long         Physics
Neutron scattering in iron.

1946    Gerald Robinson MacLane   Mathematics
(March) Concerning the uniformization of certain Riemann surfaces allied to the inverse cosine and inverse gamma surfaces.

1946    Bob Everett Watt           Physics
(June) I. Resonances in the disintegration of fluorine by protons. II. Protons from C^{13} + 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.

1947    John Ellis Evans           Physics
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\(^8\).
<table>
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<th>YEAR</th>
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<td></td>
<td>Wilton Monroe Fisher</td>
<td>Biology</td>
<td>Studies on transovarial infection with <em>Borrelia recurrentis var. turicata</em> in <em>Ornithodorus turicata</em>.</td>
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<tr>
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<td>Charles Wilson Malich</td>
<td>Physics</td>
<td>The disintegration of beryllium by deuterons.</td>
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<td></td>
<td>Jackson Dan Webster</td>
<td>Biology</td>
<td>I. Studies on the life cycle of <em>Mesocestoides latus</em> Mueller. II. The helminth parasites of the bob-white quail.</td>
</tr>
</tbody>
</table>
RECENT PUBLICATIONS*

ADDIS, CLARENCE J., JR.
(See also CHANDLER.)

ALTENBURG, EDGAR
"Tumor Formation in Relation to the Origin of Viruses," American Naturalist, LXXXI (1947), 72-76.

BENNETT, W. E.
BENNETT, W. E., T. W. BONNER, C. E. MANDEVILLE, AND B. E. WATT
BENNETT, W. E., T. W. BONNER, H. T. RICHARDS, AND B. E. WATT
BENNETT, W. E., C. E. MANDEVILLE, AND H. T. RICHARDS
BENNETT, W. E., AND H. T. RICHARDS

*By present instructional staff members and graduate students, or based on work formerly done at the Rice Institute.

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RECENT PUBLICATIONS

BONNER, T. W.
(See also BENNETT.)

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

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

BOURGEOIS, ANDRÉ

“Baudelaire’s Neurosis,” The Rice Institute Pamphlet, XXXV, No. 3 (July, 1948). (Forthcoming.)


“Les Rapports entre la Névrose de Baudelaire et sa Liaison avec Jeanne Duval,” Le Bayou (1948). (Forthcoming.)


“Réponse à la Critique du Professeur Michel Robert sur René Boylesve, l’Homme, le Peintre de la Touraine,” in Le Bayou, 9ème année, Cahier No. 34 (1947), 80-86.


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BRUNK, H. D.


BUSHEY, GORDON L.

*(See MILLIGAN.)*

CAMDEN, CARROLL


"Iago on Women," *Journal of English and Germanic Philology*. (Forthcoming.)


"The Suffocation of the Mother," *Modern Language Notes*. (Forthcoming.)

CHANDLER, ASA C.


"New Species of the Genus Schistotreia with a Key to the Known Species," *Transactions of the American Microscopical Society*. (Forthcoming.)


"The Species of the Genus Filaria, Mueller, 1787, s. str. ," *Journal of Parasitology*. (Forthcoming.)


Chandler, Asa C., and C. J. Addis, Jr.


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Chillman, James, Jr.


"Art in Houston," *Houston*, XXII (February, 1948), 9, 63.

"Giotto and Modern Art," THE RICE INSTITUTE PAMPHLET, XXXV, No. 3 (July, 1948). (Forthcoming.)

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CRAIG, HARDIN, JR.


"Secret Weapons of the Napoleonic Wars," THE RICE INSTITUTE PAMPHLET, XXXV, No. 3 (July, 1948). (Forthcoming.)

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"Early Kansas Churches," Bulletin of the Kansas State College Experiment Station. (Forthcoming.)


DIX, WILLIAM S.

"Herman Melville and the Problem of Evil," THE RICE INSTITUTE PAMPHLET, XXXV, No. 3 (July, 1948). (Forthcoming.)

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FISCHER, KATHERINE

The Burgundian Code (Leges Burgundionum), Translations and Reprints (University of Pennsylvania Press), Third Series, Vol. III. (Forthcoming.)

FULTON, JAMES S.

"Reflections on the Freedom of Science," THE RICE INSTITUTE PAMPHLET, XXXV, No. 3 (July, 1948). (Forthcoming.)
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HEAPS, C. W.

"A Laboratory Experiment on Bomb Dropping," _American Journal of Physics_, XIV, No. 3 (May-June, 1946), 210–211.

HOUSTON, WILLIAM VERMILLION


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KILPATRICK, J. E., AND K. S. PITZER


"Thermodynamic Functions for Molecules with Internal Rotation. III. Compound Rotation," _Journal of Chemical Physics_, XVI (1948). (Forthcoming.)

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

"Thermodynamics and Molecular Structure of Cyclopentane," *Journal of the American Chemical Society*, LXIX (1947), 2483.

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


**Kilpatrick, J. E., and Ralph Spitzer**


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


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


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


**Lear, Floyd Seyward**

Consulting Editor, *Corpus Juris Romani* (translation), ed. Clyde Pharr. (In process of publication.)

LITTLE, R. N.

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LONG, R. W.
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McENANY, MIKE V.

McKILOP, ALAN D.
"The Early European View of Old China," *The Rice Institute Pamphlet*, XXXV, No. 3 (July, 1948). (Forthcoming.)


MACLANE, GERALD R.
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MALICH, C. W.
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"Analytic Continuation and Infinitely Differentiable Functions," *Bulletin of the American Mathematical Society*. (Forthcoming.)

Une Inégalité sur les Séries Asymptotiques Colloque d’Analyse Harmonique (Nancy, 1947).


**Mandelbrot, S., and G. R. MacLane**


**Mandelbrot, S., and F. E. Ulrich**

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

Mandelbrojt, S., and N. Wiener

Milligan, W. O.
(See also Weiser.)

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"Mutual Protective Action in the System NiO-Cr₂O₃," American Chemical Society Abstracts of Papers, 112th meeting (September, 1947), 13F-14F.

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"The Sorption-desorption Hysteresis Characteristics of the System SiO₂-H₂O Below the Bulk Freezing Point of Water," American Chemical Society Abstracts of Papers, 110th meeting (September, 1946), 27E-28E.

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"X-ray Diffraction Examination of Hydrous Chromic Oxide," American Chemical Society Abstracts of Papers, 110th meeting (September, 1946), 14E-15E.
"X-ray Diffraction Studies in the System Cr₂O₃-ZrO₂," American Chemical Society Abstracts of Papers, 111th meeting (April, 1947), 3E.
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"Sorption-desorption Characteristics of Hydrous Oxide Pigments," American Chemical Society Abstracts of Papers, 111th meeting (April, 1947), 11E.

MOORE, DONALD V.

MORAUD, MARCEL
Études Franco-Américaines (Paris). (Forthcoming.)
"Un Hommage Américain à la France," The French Review, XX, No. 6 (1947), 459-462.
"Le Théâtre Français à Londres sous la Restauration," French Review (1948). (Forthcoming.)

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"An Experiment on the Genuineness of Unilateral Deafness Produced by Hypnosis" (abstract), American Psychologist, II (1947), 424.
“Some American Contributions to the Science of Hypnosis,”
“The Genuineness of Hypnotically Produced Anesthesia of the
Skin,” and “The Production of Blisters by Hypnotic Suggestion:
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27–38, 64–74, 279–291. Reprinted from The American Scholar
(1943), American Journal of Psychology (1937), and Journal of
Abnormal and Social Psychology (1941).

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Fish, Synodus foetens,” Journal of Parasitology, XXXIII (1947),
231–233.
“Spirometra from Texas Cats,” Journal of Parasitology, XXXIV
(1948), 71–72.
“Strigeids from Texas Mink, with Notes on the Genus Fibricola,”
Transactions of the American Microscopical Society, LXVII
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RICHARDS, H. T.
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RISSEI, J. R.
(See also BONNER.)
“Electromagnetic Horns” and “Dielectric and Metal-plate Lens
Antennas,” in Microwave Antenna Theory and Design, ed. S.
(“Radiation Laboratory Technical Series,” Vol. XII.)

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“Alpha-2n Nuclear Research,” Physical Review, LXXII (Dece-
ember 1, 1947), 1117.

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THOMAS, J. D.


TSANOFF, RADOSLAV A.


ULRICH, F. E.

(See MANDELBROJT.)

WATT, B. E.

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WEBSTER, J. DAN
“A New Acanthocephalan from the Sanderling,” Transactions of the American Microscopical Society. (Forthcoming.)
“Two New Cestodes from the Nighthawk,” Journal of Parasitology. (Forthcoming.)

WEISER, HARRY B.

WEISER, HARRY B., W. O. MILLIGAN, AND E. L. COOK

WEISER, HARRY B., W. O. MILLIGAN, AND G. A. MILLS
“Zones of Mutual Protection Against Crystallization in Dual Oxide Systems,” American Chemical Society Abstracts of Papers, 111th meeting (April, 1947), 2E–3E.

WELD, HARRY PORTER
“The Psychology of Testimony,” The Rice Institute Pam-phlet, XXXV, No. 3 (July, 1948). (Forthcoming.)

WHITEHURST, HARRY B.
(See MILLIGAN.)

WHITING, GEORGE W.
Articles on Joseph Conrad, Lord Jim, Victory, and Youth, in Collier’s Literary Encyclopedia. (Forthcoming.)
“Cherubim and Sword,” Notes and Queries, CXCII (November 1, 1947), 469-470.


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WILSON, H. A.

“Atomic Energy,” The Rice Institute Pamphlet, XXXIII, No. 4 (October, 1946), 221-229.

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WYATT, E. M.
