ANNUAL REPORT - DEPARTMENT OF PHYSIOLOGY
UNIVERSITY OF KANSAS MEDICAL CENTER
July 1, 1963 - June 30, 1964

ACADEMIC STAFF
E. B. Brown, Jr., Ph. D. Professor
Alan M. Thompson, Ph. D., Associate Professor
Norman Loofbourrow, Ph. D., Associate Professor
Lawrence Sullivan, Ph. D., Assistant Professor
Donald Johnson, Ph. D., Assistant Professor (Joint appointment in Obstetrics and Gynecology)
Kenneth Goetz, Ph. D., Instructor
John K. Leach, M. D., Lecturer
C. Frederick Kittle, M. D., Visiting Associate Professor, Department of Surgery

POSTDOCTORAL FELLOWS
Virginia Tucker, M. D., Department of Pediatrics
James Evans, M. D., Division of Anesthesiology
Benjamin Razon, M. D., AID Fellow, Far Eastern University, Manila, Philippines
Hiroshi Aoki, M. D., Surgical Fellow from Japan.

GRADUATE STUDENTS
Richard L. Clancy
Robert W. Hamilton, Jr.
Robert Thurber
Dale Mayhew
Chester Crawford
Lilly Kung
Momoko Yasuda
Dexter Bellis
Gary Slick
Franklin Richard Darrow

TEACHING
The medical school course for freshmen was reorganized so that Neurophysiology and Neuroanatomy were separated. This meant that the physiology course now consisted of Medical Physiology #270, 8 quarter credits and Physiology #271, 7 quarter credits. These courses were again offered during the fall and winter quarters, respectively. The Histology course was removed from the fall quarter and put into the spring quarter. The freshman year, then, consisted of Physiology and Biochemistry during the fall quarter, Physiology and Biochemistry during the winter quarter, until the last two weeks at which time the integrated course in Endocrinology was again presented, and Anatomy during the spring quarter.
During the year, three graduate courses and two graduate seminars were presented. Dr. Thompson's course, Physiology 310, Transport and Permeability (2 credits) was offered during the winter quarter; Dr. Sullivan's course, Physiology #315, Renal Electrolyte Excretion (2 credits); and Dr. Loofbourrow's course Physiology #322, Physiology of the Nervous System (3 credits) were offered during the spring quarter of 1964. Dr. Thompson gave a seminar on Saturday mornings on Cerebral Circulation in fall of 1963. During the spring quarter Drs. Brown and Kittle directed a Graduate Seminar (Physiology #351) on Pulmonary Mechanics. All five of these offerings were made available as electives for medical students and medical center staff.

In addition to the Senior Staff members, Postdoctoral Fellows Drs. Tucker, Evans, and Razon; and Graduate Students Clancy, Hamilton, and Thurber each carried full responsibility for one group of students in the medical school physiology laboratory course.

A Surgery-Physiology Conference was held every Wednesday during the academic year for students and staff.

During the summer of 1963 the integrated course in Basic Human Biology for Nurses was taught for the first time on this campus. The course followed essentially the same format which had been used in previous years at Lawrence, Kansas. The Physiology portion of the course was taught by Drs. Brown and Loofbourrow.

Current course offerings of the department are described as follows:
COURSE DESCRIPTIONS (Credits are quarter hours.)

270. **Medical Physiology** (8 credits). A systematic coverage in lecture, laboratory, and conferences of the following topics: Transport mechanisms, membrane phenomena, cardiovascular system, respiratory system, blood, acid-base balance. Staff.

271. **Medical Physiology** (7 credits) Continuation of 270 to cover gastrointestinal system, renal system, temperature regulation, fluid and electrolyte metabolism; nervous system. Staff.

279. **Endocrinology** (3 credits). This course is designed to present the chemistry and physiology of the steroid, protein and non-protein hormones, as well as the embryology and morphology of the endocrine glands. Lectures devoted to biosynthesis, storage, release, transport mechanisms of action and degradation of hormones. Discussion and laboratory periods devoted to study of currently used techniques of investigation. Staff.
282. **Advanced Topics (1-7).** Special studies designed and arranged on an individual basis to allow a student to pursue a particular subject through reading, special laboratory work, and conferences with a senior staff member. Staff.

286. **Reproductive Physiology (5).** Selected topics in the anatomy and physiology of the male and female reproductive systems. Readings, seminar presentations, movies, laboratory demonstrations. Greenwald.

287. **Readings in Reproductive Physiology (4).** The student will select a topic of interest and thoroughly review the literature. At bi-monthly intervals he will report his findings to the instructor. A term paper will summarize his readings. Greenwald.

310. **Transport and Permeability (2 credits).** Selected topics illustrating current concepts of material transport and membrane permeability. Primarily lecture, but written and oral reports will be required. Content will vary from year to year, but may include basic equations, permeability of various capillary beds, cells and intracellular inclusions, bioelectric phenomena, secretion and distribution volumes. Thompson.

315. **Renal Electrolyte Excretion (2 credits).** Current concepts of nephron function will be discussed with particular emphasis on electrolyte transport. The course will consist mainly of lectures, but oral reports on selected literature may be required. Subjects to be covered to a varying extent may include methods, site and nature of electrolyte transport mechanisms, countercurrent mechanism, water reabsorption, acid-base regulation, hormonal influence on kidney, regulation of renal blood flow. Sullivan.

320. **Fluid, Electrolyte, and Acid-Base Metabolism (3 credits).** Methods of determining body fluid compartments, fixed cation and anion balance, basic concepts of hydrogen ion balance, buffer systems of the body, intracellular hydrogen ion activity, interaction of these factors on each other. The course will be taught primarily from the quantitative approach with problem solving as an important feature. Brown.

322. **Physiology of the Nervous System (3 credits).** Selected topics in currently active neurophysiological problems and established concepts. Lecture, laboratory, conference, and student reports. Physiology of the central, rather than the peripheral, nervous system will be emphasized. The stereotaxic instrument will be
used for placement of lesions, drugs, and electrodes (stimulating and recording). Electronic instrumentation will be used exclusively. Prerequisite, 271. Loofbourrow.

325. **Biology of Sex** (3 credits). This course will be a series of lectures and seminars dealing with the anatomy, genetics, embryology, endocrinology and, to a minor extent, psychobiology of sex. The classical experiments on lower forms will be covered, as well as clinical problems related to congenital and endocrine based sex anomalies in man. Johnson.

350. **Research** (1-15 credits). Original laboratory investigation conducted under the supervision of a senior staff member. Staff.

351. **Seminar** (1-4 credits). Student participation conferences in which a sharply delineated field is examined in depth largely through critical review of current literature in the field. The subjects examined in these seminars are dictated by the interests of students and staff. Staff.

360. **Thesis** (1-15 credits). Credits given only after the thesis has been accepted. Staff.

**RESEARCH**

Research grants which were active during the year were the following:


Intracellular pH in endogenous and exogenous acidosis. USPHS #2-F2-HE-11 235-03. Principal Investigator: E. B. Brown, Jr. July 1, 1963 - June 30, 1964, $500. (Postdoctoral Fellow Award for Dr. Tucker.)


Distribution of sucrose and plasma protein. American Medical Association. (Medical Center #115-E) Principal Investigator: Dr. Alan Thompson, $1,000.


Right atrial pressure and heart rate. USPHS #1R01HE 08803-01 (PHY) Principal Investigator: Dr. Kenneth Goetz. June 1, 1964 - May 31, 1965, $14,417.


During the summer of 1963 the following students engaged in research projects and received research experience in the department:

Murray Corbin, Jerry Albright, Douglas Wilmore, Herbert Hilgers, Ramon Schmidt, Ralph Kauffman, Alan Moorhead, Merrill Stiles, Larry Benson, Susan Black, Terry Sutton, Jay Richardson, Tom Darrah, Bart Lindsley, and Janice Fleming. Kaw Valley Heart Summer Search Talent sponsored Steve Rosenbaum and Jack Strandmark.

PUBLICATIONS
Publications by members of the staff during the period of July 1, 1963 - June 30, 1964:


Evans, James A., and Alan M. Thompson. Circulatory adjustments of hepatic hemodynamics under anesthesia. (Abstract presented for publication to Am. Soc. of Anesthesiologists.)

VISITORS AND OUTSIDE SPEAKERS: Several outside speakers were brought into the department during the year. Institutional Research Grant funds paid expenses and honoraria for such speakers. These included:

1/10/64 Dr. Daniel H. Simmons of Cedars of Lebanon, Mt. Sinai Hospitals, "Acid-Base Changes and Pulmonary Vascular Resistance."

2/21/64 Dr. Eugene Grim, Dept. of Physiology, University of Minnesota School of Medicine, "The Application of Irreversible Thermodynamics in Biological Transport."

3/26/64 Dr. R. D. B. Dill, National Res. Found. Scholar, Dept. of Anatomy and Physiology, Indiana University, "Adaptation to high Altitude as Related to Age."

4/27/64 Dr. Gerhard Giebisch, Assoc. Prof. of Physiology, Cornell University Medical College, "Renal Tubular Transport of Na and K as Studied on Single Nephrons."

6/22/64 Dr. John M. Brookhart, Professor of Physiology and Chairman of Department of Physiology, University of Oregon Medical School, "Function For Dendrites." (Dr. Brookhart is also President Elect of the American Physiological Society.)

ACTIVITIES OF STAFF:

Dr. Brown:
Editor: Proc. Soc. Exp. Biol. and Medicine
Modern Medicine,
Member NIH Physiology Fellowship Panel.

Attended invited conference on "Oxygen Transport", held to honor Dr. Roughton, UCLA, July, 1963.

Principal speaker, Univ. of Kansas, Lawrence, for Science Day, October, 1963.

Member of Faculty, Basic Science Refresher Course, Am. College of Physicians Meeting, Atlantic City, May, 1964.

Participated in several programs sponsored by the Postgraduate Medical Education Department of KUMC. Circuit course, KUMC, December, 1963, and January, 1964.

Participated in the Alumni Day Program in the month of May, 1964.

Served as Consultant in Research, VA Hospital, Wadsworth, Kansas.

Dr. L. P. Sullivan:
Gave lecture for Postgraduate Course, KUMC, Nov., 1963.


Dr. Benjamin Razon, Postdoctoral Fellow, presented paper at Fall meetings, APS, Miami, Florida, August, 1963. Dr. Sullivan was coauthor on paper.

Lectured at VA Hospital, Wichita, Kansas, January, 1964.

Raymond Schmidt, Summer Fellow and Medical Student, gave a paper on work he had carried out with Dr. Sullivan, on Research Day, KUMC, 1964. Mr. Schmidt also gave a paper at the FASEB meeting in Chicago, Illinois, April, 1964.

Dr. A. M. Thompson:
Review Editor for some papers submitted to "Science".

Member of KUMC Research Committee from September 1963 to present.

Herbert (Bart) Lindsley, Summer Fellow and Med. Student gave a paper on work done with Dr. Thompson at KUMC Research Day, 1964.

Associated with papers and presentations listed elsewhere for Dr. James Evans.

Dr. Loofbourrow:
Presented lecture before the Kansas City Neurological Society, September, 1963.
Dr. Kenneth Goetz:

Lectured to the staff at Osowatomie State Hospital, Osowatomie, Kansas, in January of 1964.

Dr. C. F. Kittle:

Dr. Evans:

Student Research Day at KUMC - read paper on "The Acute Effects of chloroform and ether on hepatic hemodynamics."

During the year an application was made to the NIH for a Training Grant in Physiology. A site visit was made by Drs. James Dow, Loren Carlson, and John Brookhart, in December of 1963. Approval of the Training Grant for $30,000 for the first year, and $36,000 for the next four years was received in May, 1964. The grant, to begin July 1, 1964, provides money for stipends for graduate students and 60% of the salary for an Assistant Professor. Dr. John Trank has accepted our offer of this position and will join our staff in August, 1964.