the heart have entirely changed our concept of the teaching of cardiac auscultation. Our group believes that we can now teach with confidence, in that the student is aware of and appreciates the more difficult auscultatory phenomena. This confidence has developed from the testing of a large number of physicians at different stages of training with “unknown” recordings on tape before and after different teaching methods. It has become clear that it is now possible, in even a few hours, to develop the auditory acuity of physicians in the perception of heart sounds in a way that we did not believe possible. It should now be relatively easy to advance the auscultatory ability of the senior medical student to the point he would formerly have reached after a residency in medicine and the resident can be advanced beyond the attending physicians.

Some other points in which advantages occur are the more precise diagnosis of valvular disease by the use of these methods. We are chagrined to admit that we have discovered a number of both clinic and private patients in whom mild to gross diagnostic errors were made until one of the methods mentioned above was incorporated into the routine physical examination. It is now our custom initially to examine all patients with an audiovisual recorder of some type.

Follow-up of cases is much more precise and often a “new” sound or murmur has been shown to have been present for some time on review of the previous tape recordings on the patient. The diagnosis of various types of congenital heart disease has improved considerably by the recognition of the pulmonary and aortic components of the second pulmonic sound and the duration of murmurs in relation to these sounds. Many cases of mitral stenosis have been recognized because of the attention compelled by the recognition of the “opening snap” in mitral stenosis. Valuable information has been obtained by the correlation of preoperative and postoperative tape recordings of both congenital and rheumatic lesions. With further correlation it may be possible, in certain cases, to make accurate diagnoses without recourse to the expensive, time-consuming, and occasionally dangerous procedures of cardiac catheterization and angiography.

We have been gratified at being able to correlate the auscultatory findings with the post-mortem anatomic findings, though at times this correlation or lack of correlation is disconcerting in the present state of our knowledge.

Attention should be called to the library of tape recordings of heart sounds and murmurs that has been developed by a committee of the American Heart Association for the furtherance of professional education. Information about these recordings may be obtained from the American Heart Association.*

In summary, many physicians are deficient in their ability to make accurate diagnoses of certain cardiac lesions by auscultation. The careful, thoughtful physician will probably realize this deficiency in himself and will constantly seek to improve his command of this art. It is hoped that more general use of the methods briefly mentioned in this short résumé may help him in reaching this goal.

J. Scott Butterworth

* American Heart Association, 44 East 23rd Street, New York, N. Y.

All the marvellous discoveries of recent times cannot remove the physician from his post of honour in detecting morbid phenomena and following the mysterious rhythm of life and death: a post, that is, at the bedside of the patient.—Arturo Castiglioni, 1874.


Medical Eponyms

By Robert W. Buck, M.D.

Ewart’s Sign. This was described by William Ewart (1848–1929), Physician to St. George’s Hospital, in an article “Practical Aids in the Diagnosis of Pericardial Effusion, in Connection with the Question as to Surgical Treatment” which appeared in the British Medical Journal 1896 pp. 717–721 (March 21), 1896.

“Whenever fluid is effused into the pericardium the normal resonance is modified at the left posterior base in a most definite way. A patch of marked dulness . . . is found at the left inner base, extending from the spine for varying distances outwards, usually not quite so far as the scapular (angle) line, and ceasing abruptly with a vertical outer boundary. Above, its extension is also variable, according to the size of the effusion; commonly it does not extend higher than the level of the ninth or tenth rib, and here again its horizontal boundary is abrupt. Its shape then is that of a square, and it is quite unlike that of any dulness arising from pleuritic effusion . . . .

“Immediately below or slightly to the left of the tip of the left scapula a patch about 2 inches in diameter presents well-marked tubular breathing and aegophony . . . . This sign, although not so important as that of the patch of dulness, is very commonly, if not always, present in cases of considerable effusion, and gives valuable confirmation to other signs. It has been described by other observers . . . . It also occurs in pleural effusions.”

I affirm likewise of the blood in the veins, that the blood does always, and every where, run out of the lesse into the greater, and hastens towards the heart from every part: whence I gather that whatsoever quantity which is continually sent in, the arteries do receive by the veins, that the same does return and does at last flow back thither from whence it is first driven, and that by this means the blood moves circularly, being driven in its flux and reflux by the heart, by whose force it is driven into all the fibres of the arteries, and that it does afterwards successively by a continual flux return through the veins, from all those parts which draw, and streyn it through; sense it self teaches us that this is true, and collections from things obvious to sense takes away all occasion of doubt.—William Harvey, De Circulatione Sanguinis, 1649.
REFERENCES


I have no great quickness of apprehension or wit which is so remarkable in some clever men, for instance, Huxley. I am therefore a poor critic: a paper or book, when first read, generally excites my admiration, and it is only after considerable reflection that I perceive the weak points. My power to follow a long and purely abstract train of thought is very limited; and therefore I could never have succeeded with metaphysics or mathematics. My memory is extensive, yet hazy: it suffices to make me cautious by vaguely telling me that I have observed or read something opposed to the conclusion which I am drawing, or on the other hand in favour of it; and after a time I can generally recollect where to search for my authority. So poor in one sense is my memory that I have never been able to remember for more than a few days a single date or a line of poetry.

Some of my critics have said, 'Oh, he is a good observer, but he has no power of reasoning!' I do not think that this can be true, for the Origin of Species is one long argument from the beginning to the end, and it has convinced not a few able men. No one could have written it without having some power of reasoning. I have a fair share of invention, and of common sense or judgment, such as every fairly successful lawyer or doctor must have, but not, I believe, in any higher degree.

On the favourable side of the balance, I think that I am superior to the common run of men in noticing things which easily escape attention, and in observing them carefully. My industry has been nearly as great as it could have been in the observation and collection of facts. What is far more important, my love of natural science has been steady and ardent.—Charles Darwin (1809–1882).
jectos monstrava temperaturas rectal de inter 30,5 e 32,5 C. Le resultados esseva caracterisate per considerable variationes. Le datos indica que le responsas vasomotori e cardiac al efecto de frigidation esseva active a varie grados in le patientes individual e que un uniforme responsa physiologic non pote esser expectate sub le experimentalmente non-regulate conditiones del sala de operation.

REFERENCES


Hyponatremia associated with medical or surgical shock may be due to extra renal salt loss or deprivation and will show a decreased urinary salt concentration. Hyponatremia due to either renal tubular damage or adrenocortical insufficiency is associated with increased urinary salinity. A rapid simple test will differentiate between the 2 situations without delaying therapy. Studies to extend this observation further and to use this method to predict the reserve status of adrenal function are in progress.

Kitchell


Cheyne-Stokes Respiration. But there is a symptom which appears to belong to a weakened state of the heart, and which, therefore, may be looked for in many cases of the fatty degeneration. I have never seen it except in examples of that disease. The symptom in question was observed by Dr. Cheyne, although he did not connect it with the special lesion of the heart. It consists in the occurrence of a series of inspirations, increasing to a maximum, and then declining in force and length, until a state of apparent apnoea is established. In this condition the patient may remain for such a length of time as to make his attendants believe that he is dead, when a low inspiration, followed by one more decided, marks the commencement of a new ascending and then descending series of inspirations. This symptom, as occurring in its highest degree, I have only seen during a few weeks previous to the death of the patient. I do not know any more remarkable or characteristic phenomena than those presented in this condition, whether we view the long-continued cessation of breathing, yet without any suffering on the part of the patient, or the maximum point of the series of inspirations, when the head is thrown back, the shoulders raised, and every muscle of inspiration thrown into the most violent action; yet all this without rale or any sign of mechanical obstruction. The vesicular murmur becomes gradually louder, and at the height of the paroxysm is intensely puerile.

The decline in the length and force of the respirations is as regular and remarkable as their progressive increase. The inspirations become each one less deep than the preceding, until they are all but imperceptible, and then the state of apparent apnoea occurs. This is at last broken by the faintest possible inspiration; the next effort is a little stronger, until, so to speak, the paroxysm of breathing is at its height, again to subside by a descending scale.—William Stokes. The Diseases of the Heart and the Aorta. Dublin, 1854.
HEALED DISSECTING ANEURYSM


ORGANIZATION IN RESEARCH

"The catchword of our post-war times is organization. The individual freedom is our chief asset, the mainspring of the really new ideas, the guarantee of progress. Physiology does not go forward as an ordered line of battle on a continuous front, but must be carried on, as someone has aptly said, as a guerilla warfare against the unknown, conducted single-handed or by quite small units. There is no need for an extensive organization of research, but there is much need for voluntary cooperation on a limited scale between individuals and laboratories. There are many problems which can only be successfully attacked when experimental physiologists cooperate with histologists, with chemists or physicists or with clinicians, and some problems will require the combined efforts of several of these groups, but the affair is always one of local and voluntary cooperation and does not concern us here.

"While I have no faith in the organization on a large scale of research I think there is a wide and fruitful field for organization of what we might term the services behind the front."—A. Krogh. The Progress of Physiology, 1929.


Medical Eponyms

By Robert W. Buck, M.D.

Duroziez’ Sign. Paul Louis Duroziez (1826–1897) of Paris wrote of “The Intermittent Crural Double Murmur as a Sign of Aortic Insufficiency” (Du double souffle intermittent crural, comme signe de l’insuffisance aortique) in the Archives générales de Médecine, 5th series, 17: 417–443 (April), and 588–605 (May), 1861.

“The intermittent crural murmur always accompanies aortic insufficiency, and betrays it in difficult and complicated cases. It is the pathognomonic sign of this condition. Since this has never been said before by any author, I shall proceed to demonstrate the fact.... When the crural artery is compressed, the hand perceives a shock, or trembling; with the ear may be heard a bruit which may be represented by the sound toc or a peculiar murmur, the intermittent simple murmur.... If, after having compressed the artery for some little time, one slowly lessens the amount of compression, a splendid murmur will appear, especially in chlorotic subjects.... This is the continuous double murmur.

“But there is another murmur called the intermittent double murmur which is met in certain cases, to which we shall now give special study.... There are two methods of producing this double murmur, that is, with the stethoscope or with the hand. One presses gradually with the instrument until the artery is obliterated, and with a certain degree of pressure the double murmur appears... or one may apply pressure with the hand alternately both proximal and distal to the instrument with which no pressure is exerted. The proximal pressure produces the first murmur, and distal pressure produces the second murmur. This, however, can only be done when the second murmur is produced with unusual ease.”


Hypotensive agents were administered to a series of patients, some hospitalized, some ambulatory, with hypertensive disease of all degrees of severity. Dosages were such as to produce either apparent lowering of blood pressure or undesirable side effects. Hydralazine, hexamethonium, rauwolfia, veratrum alkaloids, and the low-sodium diet were used. It is pointed out that the usual method of evaluation fails to give an accurate picture of the specific role of these drugs in a treatment regimen. Data indicated that (1) inclusion of a patient in a special study may exert a hypotensive effect; (2) medicaments exert an additional effect (controlled by placebo-drug alternation); (3) nonpharmacologic stimuli in the experimental situation may have equal effect to the drug. The appraisal method outlined is of critical importance in the study of specific effects of hypotensive drugs. Of the drugs that were tried, none was found to have a specific role in treatment of hypertensive disease.

Kitchell


Two hundred and sixty-one patients from whom group A streptococci were isolated were treated for 5 days with sulfadiazine. Two hundred and sixty-four patients with exudative pharyngitis due to group A streptococci received only nonspecific therapy. The use of sulfadiazine did not eradicate the streptococci and did not prevent rheumatic fever. The drug evidently inhibited antibody formation, so that recurrent pharyngitis in the sulfadiazine group was 3 times that in the control group. Sulfonamides should not be used in the treatment of acute streptococcic pharyngitis. However, it is pointed out that sulfonamides have proved of great value in prophylaxis against infection with group A streptococci and should continue to be utilized as a prophylactic measure.

Kitchell
AHA ANNOUNCES AWARDS TO 155 INVESTIGATORS

A total of 155 research investigatorships and fellowships have been announced by the Association for the fiscal period beginning July 1, 1957 through June 30, 1958. The awards represent an expenditure of $977,000. The national research program, which the Heart Association supports jointly with its state and local affiliates, is financed through public contributions to the annual Heart Fund appeal.

Included are three career investigatorships, 80 established investigatorships, and 72 research fellowships. The $977,000 awarded in these categories represents an increase from $829,000 in the same categories last year. Still to be awarded are grants-in-aid for research projects which will be announced later this year.

The new awards raise to approximately $19,000,000 the sums allocated for cardiovascular research by the American Heart Association and its affiliates since 1948. In addition to the affiliates' share in the national research program, local Heart Associations support research studies in their own areas. A complete list of award recipients appears at the end of this section.

ABSTRACTS OF AHA SCIENTIFIC SESSIONS PAPERS DUE JUNE 15

CONFERENCE PROCEEDINGS TO BE PUBLISHED

The proceedings of the Council for High Blood Pressure Research, which met in Cleveland November 30–December 1 last year, will be published by the American Heart Association on or before June.

The transactions of the Conference on Cerebrovascular Diseases held in Princeton in January will be published under the auspices of the American Heart Association by Grune and Stratton, Inc., 381 Fourth Ave., New York City.

MICHIGAN CONFERENCE ON HYPERTENSION

A University of Michigan Regional Conference on Hypertension will take place in Ann Arbor, Michigan, June 7–8, 1957 in recognition of the twenty-fifth anniversary of the first production of experimental renal hypertension by Dr. Harry Goldblatt. Reports will be presented on the basic mechanisms of renal hypertension, including adrenal, neurogenic and renoprival aspects.

Those desiring to attend are urged to write well in advance for information and reservations to Dr. John Sheldon, Director, Department of Post Graduate Medicine, University of Michigan Medical School, University Hospital, Ann Arbor, Mich.

1956 AHA ANNUAL REPORT ISSUED

The American Heart Association's 1956 annual report, entitled "Lifelines of the Heart," describes the continued, "almost headlong" growth of heart surgery as last year's outstanding achievement in cardiovascular medicine.

The "lifelines" are described as the circuit of research, lay and professional education, and community services, which constitute the program of the American Heart Association. Calling research the "source of the lifeline," the report notes that in 1956 the American Heart Association spent 55 cents out of every dollar received by its national office to underwrite scientific studies in the cardiovascular field. The total thus expended in 1956, by both the national organization and its affiliates, was close to $5,000,000, or approximately $1,100,000 more than in 1955.

MEETINGS CALENDAR

April 15–19: Federation of Medical and Biological Societies, Chicago. Cyrus C. Erickson, 858 Madison Ave., Memphis 3, Tenn.

April 26–May 2: Society for American Bacteriologists, Detroit. J. W. Bailey, Sterling-Winthrop, Research Institute, Rensselaer, N. Y.

May 5: American Federation for Clinical Research, Atlantic City, N. J. William W. Stead, Veterans Hospital, Minneapolis 17, Minn.

May 5–10: National Tuberculosis Association, Kansas City, Mo. Mrs. Morrell DeReign, 1790 Broadway, New York 19, N. Y.


May 7–8: Association of American Physicians, Atlantic City, N. J. P. B. Beeson, Yale University School of Medicine, New Haven, Conn.


May 15–18: First Wisconsin Conference on Work and the Heart, Milwaukee. Elston L. Belknap, M.D., Marquette University School of Medicine, 561 N. 15th St., Milwaukee 3, Wis. By invitation.


June 1: American Academy of Tuberculosis Physicians, New York. Oscar S. Levin, P. O. Box 7011, Denver 6, Colo.


June 7–8: University of Michigan Regional Conference on Hypertension, Ann Arbor, Michigan. John Sheldon, M.D., Department of Post Graduate Medicine, University of Michigan Medical School, University Hospital, Ann Arbor, Mich.


ABROAD

April 10–11: Third Congress of the Israel Heart Society, Jerusalem. Dr. Karl Braun, Hadassah University Hospital, Jerusalem, P.O.B. 499.


June 23–28: International Congress on Rheumatic Diseases, Toronto, Ont. International Congress on Rheumatic Diseases, P. O. Box 237, Terminal “A”, Toronto, Ontario, Canada.

July 7–13: Brazilian Congress of Cardiology and Angiology, Rio de Janeiro. Dr. A. de Carvalho Azevedo, Rua Domingos Ferreira 28, Rio de Janeiro, Brazil.

July 14–19: International Gerontological Congress, Merano-Bolzano, Italy. Segreteria, Quarto Congresso Internazionale de Gerontologia, Viale Morgagni 85, Firenze, Italy.


September 14–21, 1958: Third World Congress of Cardiology, Brussels. Dr. F. Van Dooren, 80 Rue Merceelis, Brussels, Belgium.

AHA AWARD RECIPIENTS

Following is a list of career investigators, established investigators and research fellows selected for support during the fiscal year beginning July 1, 1957 by the Association’s Research Committee.

Career Investigators

*Lorber, Victor*, University of Minnesota Medical School, Minneapolis.

*Pappenheimer, John R.*, Harvard University Medical School, Boston.

*Coons, Albert H.*, Harvard University Medical School, Boston.

Continued Established Investigators


*Aikawa, Jerry Kazuo*, Immunophysiologic, University of Colorado School of Medicine, Denver.

*Barker, Earl Stephens*, Studies in renal physiology, normal and pathologic; University of Pennsylvania Hospital, Philadelphia.

*Beck, William Samson*, The mechanism by which hydrogen made available by carbohydrate oxidation is utilized for fatty acid synthesis; New York University College of Medicine, New York.
Benesch, Reinhold, The role of sulphhydryl and disulfide groups in biological systems; Marine Biological Laboratory, Woods Hole, Mass.

Boyle, Edwin, Jr., Comparative studies in lipoprotein transport and metabolism concerning atherosclerosis in man, monkey and pigs; Medical College of South Carolina, Charleston.

Briller, Stanley Arthur, Energetics of the myocardium; New York University College of Medicine, New York.

Brodsky, William Aaron, Renal and electrolyte metabolism; University of Louisville School of Medicine, Louisville, Kentucky.

Cohn, Mildred, Mechanisms of phosphorylation and phosphate transfer reactions; Washington University School of Medicine, St. Louis, Missouri.

Conn, Hadley L., Jr., The alterations in pressure-volume-flow relationships produced by direct cardiovascular stresses, and the effect of these alterations on transcapillary kinetics and organ metabolism; University of Pennsylvania Medical School, Philadelphia.

Curran, George Lally, The metabolic aspects of cardiovascular disease with particular reference to lipid metabolism; University of Kansas Medical Center, Kansas City.

Drell, William, Biochemical studies of the sympathetic nervous system in relation to cardiovascular function; University of California School of Medicine, Los Angeles.

DuBois, Arthur Brooks, Gas exchange in the lungs, mechanics of breathing and pulmonary capillary blood flow; University of Pennsylvania, Philadelphia.

Eckstein, Richard W., The coronary collateral circulation, the oxygen consumption of the right ventricle; Western Reserve University School of Medicine, Cleveland.

Enkinton, J. Russell, Interrelationships of cardiovascular functions and electrolyte physiology; University of Pennsylvania School of Medicine, Philadelphia.

Epstein, Franklin H., Metabolic and circulatory factors affecting the distribution and excretion of water and electrolytes; Yale University School of Medicine, New Haven.

Farber, Saul J., The role of electrolytes and their relationship to extracelluar and intracellular organic constituents in heart disease. New York University College of Medicine, New York.

Flavin, Martin, Jr., Enzyme chemistry and intermediary metabolism; New York University College of Medicine, New York.

Foulkes, Ernest Charles, Fundamental mechanisms of electrolyte transport across biological membranes; The May Institute for Medical Research, Cincinnati.

Gaudino, Mario, The intracellular and extracellular distribution of water and electrolytes in the organism; New York University College of Medicine, New York.

Gergely, John, Biochemical and biophysical studies on cardiac and skeletal muscle contraction; Massachusetts General Hospital, Boston.

Goldthwait, David Atwater, The biosynthesis of purine nucleotides; Western Reserve University School of Medicine, Cleveland.

Goodall, McCheney, Jr., Effect of cervico-stellate ganglionectomy on the adrenaline and noradrenaline content of sheep heart; unknown sympatholytic factor present in mammalian heart; Duke University Medical School, Durham, N. C.

Godfrey, Allan V. N., Hemodynamic factors affecting electrolyte metabolism and the renal excretion of electrolytes; Yale University School of Medicine, New Haven.

Grisolia, Santiago, Enzymatic patterns of nitrogen metabolism in heart muscle; University of Kansas Medical School, Kansas City.

Gross, Jerome, Studies on the structure, composition, genesis, function and malfunction of connective tissues; Massachusetts General Hospital, Boston.

Havel, Richard J., Mechanisms of lipid transport and the relation of altered lipid transport to atherogenesis; University of California School of Medicine, San Francisco.

Kaplan, Melvin, Attempt to localize tissue-deposited streptococcal antigens and antibodies in animal and human tissues by means of the fluorescein-labeling technique. Children's Medical Center, Boston.

Kun, Ernest, Pathway of the metabolism of hydroxy acids; University of California School of Medicine, San Francisco.

Kuo, Peter T., Intravascular distribution of lipid particles in clinical atherosclerosis. Hospital and School of Medicine, University of Pennsylvania, Philadelphia.

Lazarini, Abel Alfred, Jr., Metabolic and immunological changes occurring in transplanted tissues; New York University Post-Graduate Medical School, New York.

Lapcheshkin, Eugene, Basic problems of electrocardiography; University of Vermont College of Medicine, Burlington, Vermont.

Linker, Alfred, Studies on mucopolysaccharides; Columbia University, New York.

Mackler, Bruce, Metabolic sequences involved in electron transport in mammalian tissues; University of Wisconsin, Madison.

Mater, Frank M., (1) Cardiovascular effects of specific electrolyte depletion and repletion studied by means of dialysis technique; (2) Ballistocardiographic studies in the normal and abnormal subject; University of Pittsburgh School of Medicine, Pittsburgh.
Mathews, Martin B., The physical chemistry of the acid mucopolysaccharides of connective tissue and their protein complexes; University of Chicago, Chicago.

Metcalfe, James, Changes in the maternal circulation during pregnancy and labor; Boston Lying-In Hospital, Boston.

Mommaerts, Wilfried F. H. M., Chemical-physiological studies on contractile tissues; University of California Medical Center, Los Angeles.

Nelson, Clifford Vincent, (a) The mechanism of fibrillation; (b) Quantification of the vectorcardiogram; Maine Medical Center, Portland.

Osborn, John J., Extra-corpooreal circulation, physiology of hypothermia, and intracellular fluid and ionic shifts during respiratory acidosis; Stanford University School of Medicine, San Francisco.

Paterson, Philip Young, '48; Pathogenesis of selected forms of tissue damage; University of Virginia School of Medicine, Charlottesville.

Perry, Horace Mitchell, Jr., Pathogenesis and treatment of hypertension and atherosclerosis; Washington University School of Medicine, St. Louis, Missouri.

Plaut, Gerhard W. E., Pathways and compounds of intermediary metabolism with particular regard to the properties of heart muscle; New York University College of Medicine, New York.

Rose, John C., Studies of the circulation in the dog using a mechanical left ventricle. Studies in aortic insufficiency; on the relationship between arterial pressure and cardiac auscultatory phenomena; Georgetown University Medical Center, Washington, D.C.

Sanadi, D. Rao, Studies on (a) Oxidative phosphorylation and (b) Amino acid metabolism; University of California Medical School, Berkeley.

Schmidt-Nielsen, Bodil M., Comparative kidney physiology; Duke University School of Medicine, Durham, North Carolina.

Schwartz, William B., Disorders of electrolyte metabolism and kidney function; New England Center Hospital, Boston.

Schwee, Richard, The biological synthesis of protein; California Institute of Technology, Pasadena, California.

Singer, Thomas P., Oxidative metabolism of sulfur amino acids in animals; metabolism and function of new coenzymes; Henry Ford Hospital, Detroit.

Slade, Hutton Davison, The biochemistry of the group “A” hemolytic streptococcus; The Rheumatic Fever Research Institute, Chicago.

Spencer, Merrill P., Factors affecting distribution of cardiac output; Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, N. C.

Sprinson, David B., (a) Biochemistry of one-carbon intermediates; (b) Biosynthesis of aromatic compounds in bacteria; Columbia University College, New York.

Stamler, Jeremiah, Experimental atherosclerosis; Experimental hypertension, renal function in edema formation; Michael Reese Hospital, Chicago.

Stanisky, Abram B., Studies on the basic mechanisms of anti-body production in vivo and in vitro; Western Reserve University School of Medicine, Cleveland.

Stefanini, Mario, Establishment of "profile" of tests for diagnosis of thrombotic tendency; relation of the endocrine system to the blood coagulation mechanism and the pathogenesis of thromboembolism; possibilities of employment of fibrinolysin in the treatment of thromboembolism; St. Elizabeth's Hospital, Brighton, Mass.


Thal, Alan Philip, (1) Revascularization of the myocardium; (2) The mechanism of action of bacteria and bacterial toxins on small blood vessels; University of Minnesota Medical School, Minneapolis.

Wessler, Stanford, The pathogenesis of intravascular thrombosis; Beth Israel Hospital, Boston.

Zweifach, Benjamin William, Biochemical analysis of structural elements of blood-tissue barrier; New York University, New York.

Continued Research Fellows

Campbell, Edmund West, The mechanism of platelets, platelet constituents and allied factors in blood coagulation and thrombosis; New England Center Hospital, Boston.

Khairallah, Philip Amin, Mechanisms of action of vaso-active agents on muscle and nerve tissue; Cleveland Clinic, Cleveland.

Maley, Gladys Feldt, Oxidative phosphorylation, New York University College of Medicine, New York.

Ulrick, Stanley, The relation of aldosterone to edema; Columbia University, New York.

Wellauer, Donald Burton, (1) The interactions of calcium and magnesium with myosin; (II) Hydrogen bonds in the stabilization of protein configurations; Harvard University, Cambridge.

Renewal Research Fellows

Attinger, Ernst O., Correlation of dynamics of pulmonary ventilation and circulation; Boston City Hospital, Boston.

Adolph, Robert J., Effect of digitalis on heart and muscle electrolytes; University of Illinois, Chicago.

Birkhead, Newton Charles, (1) Thoracic aorta blood flow in mitral valve disease; (2) The evaluation of indigo carmine as an indicator for arterial dilution curves; Mayo Foundation, Rochester, Minnesota.
Boucot, Nancy G., Carbohydrate metabolism in uremia; Peter Bent Brigham Hospital, Boston.

Brady, Allan J., Efflux of sodium and potassium from frog ventricle; Cambridge University, Cambridge, England.

Connor, William Elliott, Lipid metabolism in atherosclerosis; State University of Iowa, Iowa City.

Corcoran, John W., Biosynthesis of vitamin B-12; Columbia University, New York.

DeWall, Richard Allison, Perfusion techniques as an aid to open intracardiac surgery; University of Minnesota, Minneapolis.

Dickerman, Herbert William, (1) Isolation, purification and characterization of nicotinamide ribotidease; (2) Synthesis of pyridine nucleotides in embryonic heart tissue; The Johns Hopkins University, Baltimore.

Feinberg, Harold, Determinants of coronary flow and cardiac metabolism; Michael Reese Hospital, Chicago.


Grinnell, Edward Hoepfner, Factors which influence myocardial irritability at subnormal body temperatures; University of Oklahoma School of Medicine, Oklahoma City.

Guze, Lucien B., Effect of tissue pressure on the susceptibility to pyogenic infection; a study of experimental pyelonephritis; Yale University School of Medicine, New Haven.

Guzman, Santiago V., Cardiovascular effects of smoking and of nicotine in experimental animals and in human subjects; University of Pennsylvania, Philadelphia.

Hancock, Ernest William, Physiological studies in relation to the surgery of valvular heart disease; Guy's Hospital, London, England.

Hatch, Frederick Tasker, Biosynthesis of methionine (Labile Methyl Groups); Massachusetts Institute of Technology, Cambridge.

Lahiry, Nripendra Lal, Amino acid metabolism of heart tissue; University of California School of Medicine, Berkeley.

Lichton, Ira Jay, Water and salt distribution in the hypertensive chick; Michael Reese Hospital, Chicago.

Martin, Dan Anderson, Effects of life situations and emotions on the precipitation and course of congestive heart failure; University of North Carolina School of Medicine, Chapel Hill.

Moskowitz, Merle Seymour, The mechanism of estrogen-induced hyperphospholipemia; University of Chicago, Chicago.

Nannino, Luddo B., Binding of ions to myosin and meromyosins and related subjects; National Institute of Arthritis and Metabolic Diseases, Bethesda.

Nitberg, Saul I., Hemorrhagic and thrombotic tendencies in polycythemia vera and other thrombotic states; New England Center Hospital, Boston.

Schlant, Robert Carl, Quantitation of valvular regurgitation; Peter Bent Brigham Hospital, Boston.

von Kaulla, Kurt N., Fibrinolytic enzymes; University of Colorado Medical Center, Denver.

Yeh, Samuel D. J., Circulating protein constituents in serum globulins; The Johns Hopkins University School of Medicine, Baltimore.

Research Fellows


August, Joseph Thomas, The relationship of aldosterone to congestive heart failure; Peter Bent Brigham Hospital, Boston.

Brandfonbrener, Martin, The diffusion of substances across the pulmonary membrane and its relation to blood flow; Columbia University, New York.

Chadsey, Charles III, Circulatory physiology of the lungs; Bellevue Hospital, New York.

Cohn, Herbert Edward, Laboratory and clinical investigation of the use of an extracorporeal circulation apparatus in congenital heart disease; Jefferson Medical College, Philadelphia.

Conrad, James Kirk, The hemodynamic adjustments in emphysema heart following conservative medical management; University of Utah, Salt Lake City.

Cranney, Robert LeVerne, The functions of the adrenal cortex in full term and premature infants; University of Utah, Salt Lake City.

Dal Cortivo, Leo A., Study of the chemical composition of the lipid material removed from coronary arteries in cases of death from heart disease; New York University, New York.

Devey, Richard Ryder, Mechanism of control of electrolyte excretion in renal disease; Barnes Hospital, St. Louis, Missouri.


Gross, John I., Metabolism of an acid mucopoly saccharide-protein complex of connective tissue; Bobs Roberts Hospital, Chicago.

Grunbaum, Benjamin Wolf, Cell physiological and cytochemical investigations of amoebae; role of elastase in atherosclerosis; Carlsberg Laboratory, Copenhagen, Denmark.

Hamdan, de la Flor Guillermo, The effects of molar sodium lactate on cardiac metabolism in dogs with digitalis intoxication; University of Pennsylvania, Philadelphia.

Hulet, William H., Renal hemodynamic and functional patterns in hypertension; New York University Bellevue Medical Center, New York.

**Joos, Howard Arthur**, Cardiac output, blood pressure and mechanisms regulating vascular resistance in infancy and childhood; Childrens Hospital Society of Los Angeles, Los Angeles.

**Kissen, Abbott Theodore**, Mechanics of normal and abnormal atrial and ventricular filling; Ohio State University, Columbus, Ohio.

**LaBella, Francis Sebastian**, Fractionation of mammalian pituitary gland by ultracentrifugation; Emory University, Atlanta, Georgia.

**Lacy, William White**, Metabolic disorders in uremia; Vanderbilt University, Nashville, Tennessee.

**Leibman, Jack**, Relationship of serum potassium concentration to arterial blood pH, exchangeable body potassium and the total body water; University of California Medical Center, San Francisco.

**Lilienfield, Lawrence Spencer**, Renal hemodynamics: red cell and plasma transit time relationships; Georgetown University Medical Center, Washington, D. C.

**McGiff, John C.**, Problems of cardiovascular physiology and pathologic physiology especially as related to coronary circulation and cardiac metabolism; Columbia University, New York.

**Marrangozi, Albert George**, Cardiac reconstruction, Mercy Hospital, Pittsburgh.

**Martin, Harry Bellamy**, (1) Determination of pressure-volume relationships of bronchi of various sizes; (2) Effect of pulmonary edema on lung compliance; Harvard School of Public Health, Boston.

**Mitchell, Fred Neal**, Carbon dioxide angiocardiology in the diagnosis of congenital heart disease; University of Virginia School of Medicine, Charlottesville, Va.

**Mueller, Helmut**, Basic physiology of muscular contraction and relaxation; Marine Biological Laboratory, Woods Hole, Mass.

**Orgel, Gerald**, Some synthetic reactions involved in the assimilation of carbon dioxide by autotrophic tissue; Purdue University, Lafayette, Ind.

**Paldino, Rita Louise**, Sex hormones and the reticuloendothelial system, University of Southern California School of Medicine, Los Angeles.

**Patel, Dalil Jehangir**, Pulmonary circulation, to seek evidence for (1) Vaso motor tone; (2) Local reflexes operating through pulmonary veins; (3) A-V shunts; University of Utah Medical School, Salt Lake City.


**Pierucci, Louis, Jr.**, Extracorporeal circulation; Jefferson Medical College, Philadelphia.

**Pinsky, Sheldon T.**, The relationship between cardiovascular and renal responses in patients with hyperkinetic circulatory states; Indiana University Medical Center, Indianapolis.

**Stoffyn, Pierre J.**, Chemistry and biochemistry of B-Heparin; Massachusetts General Hospital, Boston.

**Strawitz, Joseph George**, Structure and function of heart mitochondria in oligemic shock; University of Wisconsin Medical School, Madison.

**Stuartwout, Joseph Rodolph**, Physiology of fetal heart in hypoxia; relationship of pyridoxine to arteriosclerosis in the placenta; Tulane University School of Medicine, New Orleans, Louisiana.

**Tanaka, Angelo**, Antigenicity of proteins; Studies on streptococcal immunity. Irvington House, Irvington-on-Hudson, New York.

**Tolone, Francesco Savari**, Use of radioactive isotopes combined to selective angiocardiology; Sodersjukhuset (South Hospital), Stockholm, Sweden.

**Trawis, Randall Howard**, Physiology of aldosterone secretion in man, and possible role of steroid in disease states; Western Reserve University School of Medicine, Cleveland.

**Tuttle, Elbert P., Jr.**, Effect of total volume and of concentration of red blood cells on excretion of water and electrolytes, Emory University School of Medicine, Atlanta, Georgia.

**Ulich, Konrad**, (1) Inhibition or alteration of lesions in rabbits resembling rheumatic fever by the use of antirheumatic and antibiotic agents; (2) Inhibition or alteration of skin sensitivity to streptococcal antigens in rabbits after passive transfer of lymphocytes; Irvington House, Irvington-on-Hudson, New York.

**Vernier, Robert Lawrence**, Chronic diffuse cardiovascular disease in childhood; University of Minnesota, Minneapolis.

**Weaver, Davis Charles**, Direct experimental approach to regulation of some of the adrenal functions; St. Luke's Hospital, New York.

**Wood, John Chase**, Investigation of electrolyte transfer dynamics and associated phenomena in the isolated dog heart; Hospital of the University of Pennsylvania, Philadelphia.

**Zizzo, Frank**, Function of extravascular plasma protein, University of Colorado School of Medicine, Denver.

**New Established Investigators**

**Blankenhorn, David Henry**, Carotenoids in atherosclerosis; University of Oregon Medical Center, Portland.

**Breuer, William Russell, Jr.**, Hemodynamic and metabolic interrelationships and mechanism of action of the thyroid hormones, sympatho-adrenal hormones, and the adrenal cortical steroids; Massachusetts General Hospital, Boston.

**Combes, Burton**, Hepatic metabolism during hepatorenal hemodynamic adjustments; University of Texas Southwestern Medical School, Dallas.
Farrell, Gordon L., Physiologic factors which regulate the secretion of aldosterone; Western Reserve University School of Medicine, Cleveland.

Finnerty, Frank Ambrose, Jr., Cardiovascular evaluation of Delerium Tremens. District of Columbia General Hospital, Washington, D. C.

Gamble, James L., Jr. Mitochondrial function in relation to electrolyte transport; Johns Hopkins School of Medicine, Baltimore.

Gibson, David M., Enzymatic synthesis of fatty acids in animal tissues; University of Wisconsin, Madison, Wis.

Giebisch, Gerhard, Ion transport across renal tubules of amphibian and mammalian kidney utilizing micropuncture techniques; Cornell University Medical College, New York.

Gottschalk, Carl William, Micropuncture study of kidney function; University of North Carolina, Chapel Hill, North Carolina.

Huckabee, William Edward, Metabolic reactions to circulatory disturbances and their role in the control of the circulation; Massachusetts Memorial Hospitals, Boston.

Katz, Yale Joel, Renal revascularization in experimental hypertension and renal insufficiency; University of Southern California, Los Angeles.

Lewis, David Harold, The regulation of the circulation in man; Philadelphia General Hospital, Philadelphia.

Padawer, Jacques, Physiology of mast cell and its relation to cardiovascular function and disease; Albert Einstein College of Medicine, New York.

Ressler, Charlotte, Separation of the multiple physiological activities of certain polypeptides or proteins; Cornell University Medical College, New York.

Richmond, Jonas Edward, The role of prosthetic group of proteins in biosynthesis and metabolism of conjugated proteins; University of Rochester, Rochester, New York.

Rudolph, Abraham Morris, Pulmonary hypertension in congenital heart disease; Children's Medical Center, Boston.

Sharp, John T., Physical properties of the lungs in pulmonary edema; Studies on the mechanism of increased pulmonary vascular resistance; University of Buffalo, Buffalo, N. Y.

Staple, Ezra, Metabolism of cholesterol and mechanisms of synthesis and breakdown of related substances; University of Pennsylvania, Philadelphia.

Ulrich, Frank, Metabolic fate and mechanism of action of adrenal cortical hormones in the peripheral tissues; Yale Medical School, New Haven.

Walker, W. Gordon, (1) Plasma protein metabolism, capillary protein permeability and circulatory homeostasis; (2) Hyponatremia in congestive heart failure; (3) Electrolyte permeability in the gut; The Johns Hopkins University Medical School, Baltimore.