SUBJECT INDEX

VOLUME XIV JANUARY-JUNE, 1964

A
Acetylcholine, depressant effect on skeletal muscle, 525
Actin, cardiac, sulfhydryl groups, effect of calcium, magnesium, and ATP, 345
Adenosinetriphosphate (ATP), sulfhydryl reactivity of cardiac actin, 345
Adhesiveness, of blood elements during hypotension, determined by screen filtration, 97
Adrenal steroids, sodium retention and extra-adrenal factor, 17
Adrenergic nerve, effects on ventricular vulnerability, 516
Aggregation
of red cells, causes of, 1
of platelets and other blood elements during hypotension, 97
Aldosterone
hyperaldosteronism, 218, 471
hypersecretion in high-output cardiac failure, 471
renin release in secondary hyperaldosteronism, 218
All-or-none law, of the heart, 139
Ailoxan diabetes, vascular reactivity, catecholamines, and angiotensin, 494
Anemia, posthemorrhagic, effect on renal circulation, 414
Anesthesia
depressant effect of pentobarbital, 228
myocardial glycogen in the rat, 202
Angiotensin
chronotropic effects in the myocardium, 337
coronary circulation, resistance changes, 191
increased renin release in lymph in secondary hyperaldosteronism, 218
inotropic effects in the myocardium, 191, 337
myocardial actions of, 191, 337
production of in renal hypertension, 150
reaction to in alloxan diabetes, 494
Aorta
alterations of impedance in and performance of ventricles, 283
in atherosclerosis, lipids, cholesterol, and fatty acids, 61
collagen fibers, 400
elastin network, 400
flow patterns, 105
hypertension produced by stenosis and ischemic kidney extracts, 150
lipoprotein lipase in relation to species, age, sex, and blood pressure, 357
oxygen uptake, cyclic changes in female rats, 364
sound recording in, 105
stenosis, hypertension produced by, 150
structural components, 400
valve closure, timing of, relation to incisura and second heart sound, 387
wall, “two-phase” material, 400
Aortic-caval fistula, aldosterone hypersecretion in high-output cardiac failure, 471
Aortic incisura, valve closure, relation to second heart sound and hemodynamics, 387
Aortic stenosis, hypertension produced by, 150
Arteries
atherosclerosis in breeder rats, 32
atherosclerosis
aortic lipoprotein lipase in, 357
cholesterol in baboons, 367
experimental, lipid classes, 61
hormones in female rats, 364
renal sodium retention, 17
renin release in secondary hyperaldosteronism, 218
Arteriovenous fistula, aldosterone hypersecretion in cardiac failure, 471
Arteritis, produced by kidney extracts, 150
Atherosclerosis
aortic lipoprotein lipase in, 357
cholesterol in baboons, control variations and experiment design, 367
effects of hormones in female rats, 364
experimental, serum lipids, lipid classes, and fatty acids, 61
Atrial fibrillation
multiple recording during, 117
ventricular dysrhythmia in, 447
Atrium
fibrillation
multiple recording during, 117
ventricular dysrhythmia in, 447
multiple recording during fibrillation, 117
Thebesian drainage into, 245
Automaticity, ectopic, effects of angiotensin in the myocardium, 337
Autoradiography, electron microscopic, localization of digoxin in myocardium, 236
Autoregulation
of blood flow in skeletal muscle, venous O2, and denervation, 126
of coronary blood flow, 250
B
Baboons, cholesterol in serum, variations and experiment design, 367
Bacterial endotoxin, thrombosis and hypercoagulability, 486
Barbiturates, depressant effect of pentobarbital on central nervous system, 238
Barium sulfate, lung embolism, cardiorespiratory effects, 546
Baroreceptors, See Baroreceptors
Baroreceptors
influence on renal function, 301
stimulation, effect on forelimb vascular bed, 392
Blood
alteration during hypotension, 97

563
INDEX

[Blood–Contractility]

Cardiac failure
aldosterone hypersecretion, arteriovenous fistula, 471
sodium retention and extra-adrenal factor, 17
Cardiac muscle, See Heart muscle and Myocardium
Cardiac rate, dromotropic effects of epinephrine on intraventricular conduction time, 318
Cardiac sounds
cause and conduction of mitral sound in the heart, 426
second heart sound, valve closure and aortic insufficiency, 387
Cardiac valves, degenerative changes in coronary arteriosclerosis, 32
Cardiovascular system, effects of pentobarbital on hypothalamus and medulla, 228
Carotid artery occlusion, effect on renal function, 301
Carotid sinus, stimulation, effect on forelimb vascular bed, 392
Catecholamines. See also Epinephrine and Norepinephrine
in cardiac tissues of California hagfish, 212
reaction to, increased by alloxan diabetes, 494
Cels
death of following changes in tissue electrolyte levels in myocardial ischemia, 260
red causes of aggregation, 1
change of concentration in anemia, 414
Central nervous system, depressant effects of pentobarbital, 228
Cervical vagotomy, modification of renal response to stellate ganglion stimulation, 301
Chloride, changes in concentration with myocardial ischemia, 260
Chloroform, effect on ventricular refractory period, 44
Cholesterol
serum and tissue lipids and fatty acids in experimental arteriosclerosis, 61
variations in baboons, experiment design, 367
Chronotropic action, of angiotensin in myocardium, 337
Circulation, effects of bradykinin in man, 351
Clotting, of blood. See Coagulation
Coagulation
endotoxin and hypercoagulability, 486
as function of velocity gradient, 1
hypercoagulability
in cardiac patients under stress, 436
thrombosis and endotoxin, 486
thrombin generation in cardiac patients under stress, 436
and viscosity in thrombosis and coronary occlusion, 1
Collagen, aortic, elastin network, pressure changes, and, 409
Computer, in study of indicator dilution curves, 270
Concealed conduction, determinant of ventricular cycle length in atrial fibrillation, 447
Conduction
concealed, determining ventricular cycle length in atrial fibrillation, 447
effects of sympathetic nerve stimulation, 86
glycogen in the conduction system, 202
intraventricular, effect of epinephrine, 318
of mitral sound in the heart, 426
Contractile force, of skeletal muscle, depression by vasodilator drugs, 525
Contractile proteins, actin of cardiac muscle, effects of calcium, magnesium, and ATP, 345
Contractility
effects of angiotensin, 337
glycogen as possible energy source, 202

Circulation Research, Volume XIV, June 1964
Coronary artery
arteriosclerosis, subendocardial, myocardial, and epicardial, 32
autoregulation of blood flow, 250
common left, Thebesian drainage, 245
Coronary circulation
autoregulation of blood flow, 250
oxygen extraction, relation to peak tension, 139
resistance changes, angiotensin and norepinephrine, 191
and tail of indicator dilution curves, 270
Coronary thrombosis, blood viscosity in, 1
Curve fitting, indicator dilution theory, 502
Cycles
cardiac, intramural myocardial shear during, 536
ventricular, length of in atrial fibrillation, 447
Cyclic changes of aorta, oxygen uptake in female rats, 364

D
Denervation, autoregulation of skeletal muscle blood flow, 126
Desoxycorticosterone acetate (DCA), renal sodium retention and, 17
Diabetes mellitus, vascular reactivity, catecholamines, and angiotensin, 494
Diaphragmatic muscle, cyclic changes in oxygen uptake in female rats, 364
Diastole
determinants, 139
myocardial shear during cycle in dogs, 536
wall thickness of myocardium during cycle, 541
Diet, in experimental atherosclerosis, lipid classes, 61
Digoxin, localization in myocardium by electron microscopic autoradiography, 236
Dromotropic effect, of epinephrine on intraventricular conduction, 318
Dysrhythmia, ventricular, in atrial fibrillation, 447

E
Ectopic automaticity, in myocardium, effects of angiotensin, 331
Elastin, aortic, pressure affecting configuration of, 400
Electrolytes
calcium and sulfhydryl reactivity of cardiac actin, 345
changes in myocardial ischemia, 260
excretion by kidney during carotid artery occlusion, 301
magnesium and sulfhydryl reactivity of cardiac actin, 345
potassium and hyperkalemic effect of epinephrine on intraventricular conduction time, 318
renal sodium retention and extra-adrenal factor, 17
Electron microscopy
aortic elastin network and collagen during pressure change, 400
autoradiography, localization of digoxin in myocardium, 236
Emboli, lung, humoral transmission of cardiorespiratory changes, 546
Endocrine kidneys, hypertension produced by extracts, 150
Endotoxin, thrombosis and hypercoagulability, 486
Enzyme, lipolytic, aortic lipoprotein lipase activity, 357
Epicardium, frequency of calcification in female breeder rats, 32
Epinephrine
in cardiac tissues of California hagfish, 212
dromotropic effect on intraventricular conduction, 318
effect on ventricular refractory period and fibrillation threshold, 516
intraventricular conduction, role of associated hyperkalemia, 318
reaction to increased by alloxan diabetes, 494
Eptatretus stouti (hagfish), innervation of systemic heart of, 212
Erythrocytes
aggregation of, thixotropy of blood and tendency toward thrombosis, 1
change of concentration in anemia, 414
Estradiol, effect on oxygen consumption in the aorta, 364
Estrogens, effect on oxygen consumption in the aorta, 364
Excitability, nonuniform recovery in ventricular muscle, 44
Excitation, ventricular, effects of cardiac sympathetic nerve stimulation, 86
Experiment design, cholesterol in serum of baboons, 367

F
Factor XI (plasma thromboplastin antecedent), and thrombogenic effect of endotoxin, 486
Fatty acids, and lipid patterns in experimental atherosclerosis, 61
Fibrillation
atrial, multiple recording during, 117
ventricular dysrhythmia in, 447
ventricular adrenergic effects, 516
nonuniform recovery of excitability during refractory period, 44
Filtration, glass wool, alteration of blood during hypotension, 97
Fistula, arteriovenous, aldosterone hypersecretion in cardiac failure, 471
Flow. See Blood flow
Fluid retention, and extra-adrenal factor, 17

G
Gamma variate, indicator transit time, 502
Gastrocnemius, depressant effect of vasodilator drugs, 525
Glass wool filtration, effect on alteration of blood during hypotension, 97
Glycogen, spatial distribution in the conduction system, 202

H
Hagfish (Eptatretus stouti), innervation of systemic heart of, 212
Heart
actin from muscle, sulfhydryl groups, 345
all-or-none law, systole determinants, 139
aortic impedance alterations on performance of ventricles, 283
autoregulation of coronary blood flow, 250
conductance, 139
concealed, 447
effects of sympathetic nerve stimulation, 86
glycogen and phosphorylase in the conduction system, 202
intraventricular, 318
of mitral sound, 426
contractility
effects of angiotensin, 337
glycogen as energy source, 202

Circulation Research, Volume XIV, June 1964
INDEX

[Heart—Ischemia]

contraction and relaxation, oxygen consumption during, 294

Hormones
- estrogens, effect on oxygen consumption in the aorta, 364
- sodium-retaining, renal sodium retention and, 17

Hydrodynamics, of aortic flow, 105

Hydrogen gas, polarographic measurement in tissues and blood, 164

Hyperaldosteronism
- dual assay for renin in lymph, 218
- in high-output cardiac failure, 471

Hypercoagulability
- and thrombin generation in cardiac patients under stress, 436
- thrombosis and endotoxin, 486

Hyperkalemia, and dromotropic effect of epinephrine on intraventricular conduction, 318

Hypertension
- aortic lipoprotein lipase activity, 357
- malignant, produced by endocrine kidney, 150
- renal, produced by aortic stenosis and extracts of ischemic kidneys, 150
- production of angiotensin, 150

Hypophysectomy, aldosterone hypersecretion in high-output cardiac failure, 471

Hypotension
- alteration of blood during, 97
- cardiac function reduced by, 327

Hypothalamus, effects of pentobarbital, 228

Impulse formation, in myocardium, effects of angiotensin, 337

Indicator dilution
- computer in study of curves, 270

Impedance, aortic, and ventricular performance, 283

Indicator transit time, statistical distribution function, 502

Inotropic action
- angiotensin
- coronary and myocardial effects, 191
- on mammalian atrial and ventricular muscle, 337
- mobilization of tension in the myocardium, 139

Intraventricular conduction, dromotropic effect of epinephrine and associated hyperkalemia, 318

Iodine 131 clearance, from muscle, acetylcholine and d-tubocurarine, 525

Ischemia
- myocardial
cell death following changes in tissue electrolyte levels, 260
effect on ventricular refractory period, 44
renal, hypertension produced by, 150

Circulation Research, Volume XIV, June 1964

566
INDEX

Isoproterenol—Occlusion

Isoproterenol, effect on intraventricular conduction time, 318

Juxtaglomerular cells, aldosterone hypersecretion in high-output cardiac failure, 471

Kidney
anemia and renal circulation, 414
electrolyte excretion, 301
endocrine, hypertension produced by extracts, 150
extracts
aldosterone production and, 471
hypertension produced by, 150
ischemic, hypertension produced by extracts, 150
sodium retention and extra-adrenal factor, 17
stellate ganglion stimulation and carotid artery occlusion, 301
water excretion during carotid occlusion, 301

Law of the heart, factors affecting, 139

Least-squares method, of curve fitting for indicator dilution curves, 502

Left anterior atrial artery, drainage directly into left atrium, 245

Left circumflex artery, drainage from left coronary artery, 245

Lipids, of serum and tissue in experimental atherosclerosis, 61

Lipolytic enzyme, aortic lipoprotein lipase activity, 357

Lipoprotein lipase, in the aorta, in relation to species, age, sex, and blood pressure, 357

Lung embolism, pulmonary smooth muscle-constricting agent in embolism, 546

Lymph, dual assay for renin in, 218

Magnesium, sulfhydryl reactivity of cardiac actin, 345

Mast cells, disappearance from myocardium in coronary arteriosclerosis, 32

Mechanics
mechanical behavior of the myocardium, 73
myocardial shear during cardiac cycle in dogs, 536
wall thickness of myocardium during cardiac cycle, 541

Medulla, effects of pentobarbital, 228

Metabolism, oxygen consumption of ventricle, 294

Mitral heart sounds, cause and conduction of, 426

Mixing, in the aorta, 105

Mucopolysaccharides, arteriosclerosis in breeder rats, 32

Multiple recording, during atrial fibrillation, 117

Muscle
cardiac
actin from, sulfhydryl groups, 345
tension-velocity-length relationships, 73
diaphragmatic, cyclic changes in $O_2$ uptake in female rats, 364
gastrocnemius, depressant effect of vasodilator drugs, 525
inotropic effects of angiotensin, 191, 337
papillary
calcification in coronary arteriosclerosis, 32
eknotic automaticity, 337
inotropic effects of angiotensin, 191, 337

Circulation Research, Volume XIV, June 1964

pulmonary smooth muscle-constricting agent in embolism, 546
skeletal
actin from, sulfhydryl reactivity, 345
autoregulation, venous $O_2$, and denervation, 126
blood flow, 126, 164, 525
contractile force, depression by vasodilator drugs, 525
d-tubocurarine and $^{131}$I clearance from, 525
ventricular, recovery of excitability, 44
Myocardium
infarction, tissue electrolyte levels in, 260

Necrosis
myocardial
with electrolyte changes, 280
produced by kidney extracts, 150

Nerves. See also Sympathetic nervous system
depressant effects of pentobarbital on central nervous system, 226
in heart of California hagfish, 212

Norepinephrine
coronary circulation, resistance changes, 191
effect on myocardial shear, 536
reaction to increased by alloxan diabetes, 494
ventricle
effect on refractory period and fibrillation threshold, 518
effect on wall thickness, 541

Occlusion
carotid artery, effect on renal function, 301
coronary, viscosity and coagulation of blood in, 1
**Ouabain**
- effect on ventricular refractory period, 44, 516

**Oxygen**
- autoregulation of blood flow in skeletal muscle, 126
- consumption
effects of estrogens, 364
myocardial, during ventricular contraction and relaxation, 294
uptake
- in the aorta, cyclic changes in female rats, 364
- myocardial, 139

**Papillary muscle**
- calcification in coronary arteriosclerosis, 32
- inotropic effects of angiotensin, 191, 337

**Pentobarbital**
- depressant effects on central nervous system, 228

**Peripheral vascular bed**
- functional deterioration as result of hypotension, 327

**Phosphorus**
- changes in concentration with myocardial ischemia, 260

**Phosphorylase**
- and glycogen distribution in the conduction system, 202

**Pituitary gland**
- aldosterone hypersecretion in high-output cardiac failure, 471

**Plasma thromboplastin antecedent (Factor XI)**
- and thrombogenic effect of endotoxin, 486

**Platelets**
- adhesiveness and aggregation determined by glass wool filtration, 97

**Polarographic measurement**
- of local blood flow with hydrogen gas, 164

**Posthemorrhagic anemia**
- effect on renal circulation, 414

**Potassium**
- changes in concentration with myocardial ischemia, 260
- intraventricular conduction, effect of epinephrine, 318

**Pressoreceptor.** See Baroreceptors

**Pressure-flow curves**
- in autoregulation of coronary blood flow, 250

**Protein**
- aortic lipoprotein lipase activity, 357
- contractile, actin of cardiac muscle, effects of calcium, magnesium, and ATP, 345

**Pulmonary embolism**
- humoral transmission of cardiorespiratory changes, 546

**Quinidine**
- effect on ventricular refractory period, 44, 516

**Random-walk curves**, compared with single-pass indicator dilution curves in coronary circulation, 270

**Recording**
- multiple, during atrial fibrillation, 117
- sound, in the aorta, 105

**Red blood cells**
- aggregation of and thixotropy of blood and tendency toward thrombosis, 1
- change in concentration in anemia, effect on renal circulation, 414

**Reflexes**
- presympathetic, right ventricular, 461
- skeletal muscle blood flow, autoregulation of, 126

**Refractory period**
- ventricular
- adrenergic effects, 516
effect of sympathomimeticamines, 44, 516

**Regional circulation**, effects of bradykinin in man, 351

**Renal circulation**
- blood flow measurement with hydrogen gas, 164
carotid artery occlusion, 301
effect of posthemorrhagic anemia, 414
- hypertension
- aortic lipoprotein lipase activity, 357
- production of angiotensin, 150
- production by extracts of ischemic kidneys, 150
- ischemia, hypertension produced by, 150
renin, 150

**Renal function**
- baroreceptor influence, 301
- relationship to aldosterone secretion, 471

**Respiration**
- cardiorespiratory changes in lung embolism, 546

**Rhythm**
- ventricular dysrhythmia in atrial fibrillation, 447

**Screen filtration pressure method**
- for determination of adhesiveness and aggregation of blood, 97

**Second heart sound**, valve closure, aortic insufficiency, 387

**Serum**
- cholesterol
- in experimental atherosclerosis, 61
- variations in baboons, 367
- lipids in experimental atherosclerosis, 61

**Shear**
- and blood viscosity, 1
- myocardial, during cardiac cycle, 536

**Shock**
- hemorrhagic, cardiac deterioration in, 327

**Single-pass curves**, indicator dilution technique, and coronary circulation, 270

**Skeletal muscle**
- actin from, sulfhydryl reactivity of, 345
- autoregulation, venous \(O_2\), and denervation, 126
- blood flow
- autoregulation of, 126
depressant effect of vasodilator drugs, 525
- measurement with gaseous hydrogen, 164
- contractile force, depression by vasodilator drugs, 525
d-\(\text{tubocurarine} and 1^{31}\) clearance from, 525

**Sodium**
- changes in concentration with myocardial ischemia, 126
tenretention and extra-adrenal factor, 17

**Sodium pentobarbital**, depressant effect on central nervous system, 228

**Sound**
- conduction of mitral sound in the heart, 426
- recording in the aorta, 105
- second heart sound, valve closure and aortic insufficiency, 387

**Stasis thrombi**, induced by bacterial endotoxin, 486

**Stellate ganglion**, stimulation, modification of renal response by cervical vagotomy, 301

**Stenosis**
- aortic, hypertension produced by, 150

**Steroids**
- adrenal, sodium retention and extra-adrenal factor, 17

_Circulation Research, Volume XIV, June 1964_
Vascular bed, carotid baroreceptor stimulation in fore-limb of the dog, 392
Vascular disease, produced by aortic stenosis and extracts of ischemic kidneys, 150
Vascular reactivity, diabetes mellitus, 494
Vasodilator drugs, depression of muscle force by, 525
Veins
flow in, by indicator dilution method, 377
oxygen, and autoregulation of blood flow in skeletal muscle, 126
Velocity
gradient, and blood conduction, 1
tension and length relationships in cardiac muscle, 73
Venous flow, indicator dilution measurements, 377
Ventricle
angiotsin, effects in myocardium, 337
cycle length, concealed conduction as determinant of in atrial fibrillation, 447
dysrhythmia, in atrial fibrillation, 447
epinephrine, effect on intraventricular conduction time, 318
excitability recovery, 44
excitation, sympathetic effects on, 86
fibrillation
recovery of excitability during refractory period, 44
threshold, adrenergic effects, 516
glycogen distribution, 202
intraventricular conduction time, effect of epinephrine, 318
left
oxygen consumption during contraction and relaxation, 294
wall thickness during cardiac cycle, 541
muscle, recovery of excitability, 44
norepinephrine
on refractory period and fibrillation threshold, 516
on wall thickness, 541
oxygen consumption during contraction and relaxation, 294
performance with change in aortic impedance, 283
phosphorylase distribution, 202
refractory period, effect of sympathomimetic amines, 44, 516
right presor reflex from, 461
vulnerable period, 516
Ventricular fibrillation
adrenergic effects, 516
recovery of excitability in muscle, 44
Viscometer, rotational cone-in-cone, for blood viscosity measurements in thrombosis and coronary occlusion, 1
Viscosity, of blood in thrombosis and coronary occlusion, 1
Vulnerable period, ventricular, adrenergic effects, 516
Wall
aortic, “two-phase” material of, 400
myocardial, thickness during cardiac cycle, 541
ventricular, effect of norepinephrine on thickness, 541
Water
changes in water content of myocardium with ischemia, 260
excretion of kidney during carotid occlusion, 301
Work of the heart
capacity reduced by hypotension, 327
with changes of aortic impedance, 283