

## CONTENTS

### NUMBER 1, SEPTEMBER, 1936

I. A Modified Pigeon Method for the Bioassay of Anti-Pernicious Anemia Liver Extracts. G. E. Wakerlin, H. D. Bruner, and J. M. Kinsman.....	1
II. The Absorption of Ferrous and Ferric Compounds from the Intestines of Rabbits. Otto Fürth, and Rudolf Scholl.....	14
III. The Effect of Sympathectomy on the Sensitivity to Adrenalin of the Bronchioles. CoTui, Charles L. Burstein, and Arthur M. Wright.....	33
IV. Studies upon the Persistence of Action of Digitalis and Digitalis Bodies. H. B. Haag.....	42
V. Comparison of the Pressor Effects of Some New Alkyl Derivatives of $\beta$ Phenylethylamine. W. E. Hambourger and Robert B. Jamieson, Jr.....	53
VI. The Local Anaesthetic Activity of Quinoline Compounds. H. K. Sinha.....	62
VII. The Effect of Oxygen Inhalation on the Course of Acute Alcoholic Intoxication. Thomas C. Butler.....	68
VIII. The Relative Anaesthetic Activity of the Butanes and Pentanes. Roger W. Stoughton and Paul D. Lamson.....	74
IX. Studies on Insulin with Protamine. D. A. Scott and A. M. Fisher.....	78
X. The Effect of Various Substances on the Action of Insulin. A. M. Fisher and D. A. Scott.....	93
XI. Studies on the Synergism and Antagonism of Drugs. II. The Action of Physostigmine on Autonomic Ganglia. Theodore Koppanyi, James M. Dille and Charles R. Linegar.....	105
XII. The Influence of the Anesthetic on the Results of Digitalis Assay by the Cat Method of Hatcher and Brody. Chas. C. Haskell....	111

### NUMBER 2, OCTOBER, 1936

XIII. Studies of Barbiturates. XVII. The Effect of Prolonged Chloroform Anesthesia on the Duration of Action of Barbiturates. Theodore Koppanyi, James M. Dille and Charles R. Linegar....	119
XIV. Studies on Barbiturates. XVIII. Analysis of a Peripheral Action of Barbiturates. Charles R. Linegar, James M. Dille and Theodore Koppanyi.....	128
XV. The Influence of Diallylmalonylurea Upon the Metabolic Response of the Cat to Dinitrophenol. George Brewer.....	135
XVI. Ethers of Choline and Allied Compounds. Reid Hunt and R. R. Renshaw.....	140

XVII. Bacteriostatic Action of Certain Furan Derivatives. N. M. Phatak and C. D. Leake.....	155
XVIII. Studies of Phenanthrene Derivatives. VII. A Comparison of Analogous Phenanthrene and Dibenzofuran Derivatives. Nathan B. Eddy.....	159
XIX. The Anesthetic Properties of Tetrahydrofuran. Roger W. Stoughton and Benjamin H. Robbins.....	171
XX. Toxicity and Local Anesthetic Activity of Alkyl Esters of 2-Furoic Acid. N. M. Phatak and G. A. Emerson.....	174
XXI. Barbiturate-Strychnine Antagonism in the Spinal Cat. A Quantitative Study. E. L. Porter and E. L. Allamon.....	178
XXII. Effects of Sodium Bicarbonate on the Antipyretic Action and Toxicity of Acetanilid. Paul K. Smith.....	192

## NUMBER 3, NOVEMBER, 1936

XXIII. Studies on Barbiturates. XIX. Analysis of the Barbiturate-Picrotoxin Antagonism. Theodore Koppányi, Charles R. Linegar and James M. Dille.....	199
XXIV. Pharmacological Contributions to the Problem of the Autonomic Control of Skeletal Muscle Tonus. S. Loewe.....	229
XXV. Toxicity of Strychnine for Male and Female Rats of Different Ages. Charles F. Poe, John F. Suchy and Norman F. Witt.....	239
XXVI. Studies of Cyclopropane. I. The Quantitative Determination of Cyclopropane in Air, Water, and Blood by Means of Iodine Pentoxide. Benjamin H. Robbins.....	243
XXVII. Studies of Cyclopropane. II. Concentrations of Cyclopropane Required in the Air and Blood for Anesthesia, Loss of Reflexes, and Respiratory Arrest. Benjamin H. Robbins.....	251
XXVIII. The Effect of Zinc and Aluminum on the Hypoglycemic Action of Insulin. J. F. Fazekas and H. E. Himwich.....	260
XXIX. Temporary Paralysis of the Vagus Mechanism in the Turtle Heart by Sodium Citrate and Sodium Oxalate. George D. Shafer.....	264
XXX. Paralyzing Effects of Sodium Citrate on the Cardiac Vagus and on Heart Muscle of the Cat. George D. Shafer and Jefferson M. Crismon.....	274
XXXI. Quantitative Studies with the Thyrotropic Hormone. W. Kenneth Cuyler, Benjamin F. Stimmel and Roy D. McCullagh.....	286
XXXII. The Effect of Coffee and Decaffeinated Coffee on Oxygen Consumption, Pulse Rate and Blood Pressure. Kathryn Horst, Robert J. Willson and Ralph G. Smith.....	294
XXXIII. The Bile Acids in Icterus Produced by Toluylenediamine. John M. McGowan, Jesse L. Bollman and Frank C. Mann.....	305
XXXIV. The Effect of Adrenalin upon the Duration of Ventricular Fibrillation in the Cat after the Administration of Ergotamine. Dietrich C. Smith.....	312
XXXV. Propylene Impurities. Hexenes and Hexanes. V. E. Henderson and A. H. R. Smith.....	319

CONTENTS

V

XXXVI. Note on the Methyl Choline. Reid Hunt.....	328
XXXVII. The Pharmacological Action of the Alkaloids of Fumaraceous Plants. III. Dicentrine Methine Hydrochloride. R. A. Waud.....	332
XXXVIII. A Comparative Study of the Effects of Five Choline Compounds Used in Therapeutics: Acetylcholine Chloride, Acetyl- $\beta$ - Methylcholine Chloride, Carbaminoyl Choline, Ethyl Ether- Beta-Methylcholine Chloride, Carbaminoyl-Beta-Methylcho- line Chloride. H. Molitor.....	337

NUMBER 4, DECEMBER, 1936

XXXIX. Actions of Kurchicine, an Alkaloid of Holarrhena Antidysen- terica. Ilahi Bakhsh.....	361
XL. The Pharmacological Actions of Conessine and Iso-conessine. Ilahi Bakhsh.....	373
XLI. An Explanation of Duodenal Activity. W. J. R. Camp.....	393
XLII. A Liver Preparation Protecting Against Necrosis from Chloro- form or Carbon Tetrachloride Administration. J. C. Forbes, R. C. Neale and J. H. Scherer.....	402
XLIII. A Pharmacodynamic Study of the Autonomic Nervous System in Normal Men. The Effects of Intravenous Injections of Epinephrine, Atropin, Ergotamine and Physostigmine upon the Blood Pressure and Pulse Rate. H. Freeman and H. T. Carmichael.....	409
XLIV. Studies of Chronic Morphine Poisoning in Dogs. VI. Effect of Increasing Tissue Oxidations by Dinitrophenol on the Excre- tion of Morphine in Tolerant and Non-tolerant Dogs. O. H. Plant and D. Slaughter.....	417
XLV. The Toxicity of Rhodium. O. H. Plant.....	428
XLVI. On the Detoxification of Gaseous Hydrocyanic Acid. James N. Etteldorf.....	431
XLVII. The Properties of the Physiologically Active Substance in the Body Resulting from the Administration of Acetyl-Beta- Methylcholine Chloride by Iontophoresis. W. F. Alexander and A. J. Kotkis.....	439
XLVIII. A Comparison of the Minimum Fatal Doses of Selenium, Tel- lurium, Arsenic and Vanadium. Kurt W. Franke and Alvin L. Moxon.....	454
XLIX. The Pharmacological Action of Deuterium Oxide. I. Toxicity and Symptoms; Metabolic Rate; Water Exchanges. Henry G. Barbour and Jane Trace.....	460

## ILLUSTRATIONS

Maximum, minimum, and average daily reticulocyte counts of group of 30 grain-fed pigeons over period of eight weeks (fig. 1).....	6
Effect of parenteral liver extract on daily reticulocyte count of pigeon (fig. 2)..	8
Persistence of action of four tinctures of digitalis in pigeon (fig. 1).....	47
— of action of three specimens of verodigen in pigeons (fig. 2).....	48
— of action of ouabain, strophanthin, and digitoxin in pigeons (fig. 3)...	49
Résumé of persistence of action of various digitalis substances in pigeons (fig. 4).....	50
Blood pressure in cats (figs. 1-9).....	55
Effect of protamine prepared from testes of coho salmon and of rainbow trout on prolongation of insulin actions in rabbit (chart 1).....	82
Level of blood sugar in group of 30 rabbits following injection of insulin and protamine from steelhead salmon compared with hypoglycaemia in similar group of rabbits injected with insulin without protamine (chart 2).	83
— of blood sugar in group of 30 rabbits following injection of insulin and protamine from spring salmon compared with hypoglycaemia in similar group of rabbits injected with insulin alone (chart 3).....	84
— of blood sugar in rabbits following injection of low ash insulin (chart 4)...	85
— of blood sugar in rabbits following injection of low ash insulin (chart 5)...	86
— of blood sugar following injection of low ash preparations of insulin and of protamine with and without addition of zinc (chart 6).....	87
Effect of standing on protamine-insulin complex and of addition of zinc (chart 7).....	88
Level of blood sugar in dogs following injection of insulin to which either zinc, or spermine, or both had been added (chart 1).....	97
— of blood sugar following injection of insulin and zinc with and without addition of thymus preparation (chart 2).....	97
— of blood sugar following injection of insulin and zinc with and without addition of thymus preparation (chart 3).....	98
Effect on blood sugar following injection of crystalline insulin in solution and in suspension (chart 4).....	100
— of physostigmine after peripheral vagus has been nicotinized and rendered inactive to electrical stimulation (fig. 1).....	107
— of pilocarpine after peripheral vagus has been nicotinized and rendered inactive to electrical stimulation (fig. 2).....	108
— of barbiturates on vagus (rabbit)(fig. 1).....	130
— of barbiturates on vagus (dog) (fig. 2).....	131
Liquid electrode (fig. 1).....	181
Normal variations in flexion reflex threshold in spinal cat over period of 5 hours (fig. 2).....	184
Effect of luminal on flexion reflex threshold in spinal cat over period of 6 hours (fig. 3).....	185

Effect of luminal on flexion reflex threshold in spinal cat over period of 6½ hours (fig. 4).....	185
— of evipal on flexion reflex threshold in spinal cat over period of 8 hours (fig. 5).....	186
— of evipal on flexion reflex threshold in spinal cat over period of 4½ hours (fig. 6).....	186
— of amytal on flexion reflex threshold in spinal cat over period of 5 hours (fig. 7).....	187
Effects of varying amounts of sodium bicarbonate on 50 per cent fatal dose of acetanilid (fig. 1).....	193
Fatalities produced by varying amounts of sodium bicarbonate and acetanilid in molecular ratio of 2 to 1 (fig. 2).....	194
Effect of sodium bicarbonate in molecular ratio of 2 to 1 on minimal antipyretic dose of acetanilid in fevered rats; also effect of sodium bicarbonate on one-half the acute toxic dose of acetanilid in normal animals (fig. 3)....	195
Growth of rats receiving daily doses of acetanilid and of rats receiving daily doses of acetanilid and sodium bicarbonate (fig. 4).....	196
Temperature curves of dogs receiving massive intravenous doses of sodium barbital (fig. 1).....	204
Excretion of massive intravenous doses of sodium barbital (fig. 2).....	205
Effect of intravenous administration of pentobarbital on blood pressure and respiration of dog (fig. 3).....	214
— of intravenous administration of sodium amytal on blood pressure of dog (fig. 4).....	216
Strychnine toxicity curves for male rats of different ages (fig. 1).....	240
— toxicity curves for female rats of different ages (fig. 2).....	241
Record of turtle heart the cardiac vagus of which was easily paralyzed with sodium citrate without weakening auricular and ventricular beats much (fig. 1).....	268
— showing inhibition by stimulation of crescent, when stimulation of vagus trunk would not stop the heart, following paralysis of cardiac vagus mechanism by sodium citrate (fig. 2).....	271
Effect of coffee and decaffeinated coffee on oxygen consumption (fig. 1).....	300
Bile salt content of bile, blood and urine of dog with biliary fistula (fig. 1).....	307
Bilirubin content of bile, blood and urine of dog with biliary fistula (fig. 2).....	309
Blood pressure record showing duration of ventricular fibrillation in ergotized cat before and after injection of adrenalin chloride (fig. 1).....	316
Effect of choline compounds on carotid blood pressure of rabbits anesthetized with urethane (fig. 1).....	343
— of choline compounds on carotid blood pressure of rabbit anesthetized with urethane (fig. 2).....	344
— of choline compounds on carotid blood pressure of rabbits anesthetized with urethane (figs. 3 and 4).....	345
— of choline compounds on carotid blood pressure of rabbit anesthetized with urethane (fig. 5).....	346
— of choline compounds on carotid blood pressure of rabbit anesthetized with urethane (fig. 6).....	347

Light transmission through ear and skin temperature of rabbit subjected to choline iontophoresis (fig. 7).....	348
Effect of choline compounds on leg volume, intestinal volume and blood pressure of rabbit anesthetized with urethane (fig. 8).....	349
— of choline compounds on carotid blood pressure, leg volume and intestinal movements of rabbit anesthetized with urethane (fig. 9).....	350
— of choline compounds on isolated heart of <i>Rana pipiens</i> (with Straub cannula) (fig. 10).....	351
— of choline compounds dropped into eye of cat (fig. 11).....	353
— of choline compounds on isolated intestines of rabbit (fig. 12).....	355
— of kurchicine on blood pressure, intestinal movements, respirations, and uterine movements in cat anesthetized by chloralose (fig. 1).....	365
— of kurchicine on blood pressure and respirations of cat anesthetized by chloralose (fig. 2).....	366
— of kurchicine on perfused isolated frog's heart (fig. 3).....	368
— of kurchicine on blood pressure and intestinal volume of rabbit anesthetized by urethane (fig. 4).....	369
— of kurchicine on isolated rabbit's uterus (fig. 5).....	370
— of conessine on blood pressure and respiration of cat anesthetized by chloralose (fig. 1).....	378
— of conessine on blood pressure and respiration of rabbit anesthetized by urethane (fig. 2).....	379
— of iso-conessine on blood pressure and respiration of cat anesthetized by chloralose (fig. 3).....	386
— of iso-conessine on isolated perfused frog's heart (fig. 4).....	386
— of iso-conessine on isolated perfused rabbit's heart (fig. 5).....	387
— of iso-conessine on isolated non-pregnant uterus of rabbit (fig. 6).....	389
— of iso-conessine on blood pressure, intestinal movements, uterine movements, and respiration of rabbit anesthetized by urethane (fig. 7).....	390
Contraction of duodenum following primary relaxation induced by potassium permanganate (fig. 1).....	394
Action of epinephrine inhibited by potassium permanganate (fig. 2).....	394
Contrasting actions of potassium ferri- and ferrocyanide on duodenum and blood pressure (fig. 3).....	395
Relaxation of duodenum by potassium chlorate (fig. 4).....	395
Contraction effected by superoxol (fig. 5).....	396
Primary potassium effect produced by potassium permanganate, followed by increased activity due to oxidation (fig. 6).....	396
Relaxation induced by hydroquinone, quinhydrone and quinone (fig. 7).....	397
Section of liver from rat treated with liver preparation and killed after acute poisoning with carbon tetrachloride (fig. 1).....	405
— of liver from control rat killed after acute poisoning with carbon tetrachloride (fig. 2).....	405
— of liver from rat treated with liver preparation and killed after acute poisoning with chloroform (fig. 3).....	405
— of liver from control rat killed after acute poisoning with chloroform (fig. 4).....	405
Convulsive concentrations of HCN in inspired air (fig. 1).....	433

Effect of different exposures to gaseous HCN on convulsive concentration in dogs (fig. 2).....	435
Prophylactic effect of methylene blue on convulsive concentration of HCN gas in dogs (fig. 3).....	436
Action of acetyl-beta-methylcholine chloride (fig. 1).....	443
— of acetyl-beta-methylcholine chloride (fig. 2).....	445
— of acetyl-beta-methylcholine chloride (fig. 3).....	447
— of acetyl-beta-methylcholine chloride (fig. 4).....	448
Mouse showing uniform pilomotor effect after one day's D <sub>2</sub> O administration (fig. 1).....	465
Successive stages in jumping reflexes of mouse on seventh day of drinking heavy water (fig. 2).....	466
Effects of 99.5 per cent heavy water on metabolism of standard ovariectomized mice (fig. 3).....	469
— of 50 and 40 per cent heavy water on metabolism (fig. 4).....	470
— of heavy water given by stomach tube to mouse compared with normal mouse given identical amounts of food per body weight (fig. 5).....	471
Metabolic and other changes in mouse during administration of heavy water compared with changes in another standard mouse given H <sub>2</sub> O only, with identical daily amounts of food (fig. 6).....	472
Effects of D <sub>2</sub> O in standard mouse compared with another standard mouse given identical amounts of food and H <sub>2</sub> O (fig. 7).....	473
Water balance averages in normal mice and some of the same mice treated with D <sub>2</sub> O (fig. 8).....	476
Effects of 99.5 per cent D <sub>2</sub> O on water balance and urine output of standard mice (fig. 9).....	477
— of 50 per cent D <sub>2</sub> O on water balance, body weight and urine flow (fig. 10).....	478
— of 40 and 25 per cent D <sub>2</sub> O on water balance, body weight and urine flow (fig. 11).....	479