## CONTENTS

Number 1,	JANUARY,	1938
-----------	----------	------

I. The Effect of Digitalis on the Anesthetized Dog. I. Action on	
the Splanchnic Bed. L. N. Katz, S. Rodbard, M. Friend and	
W. Rottersman	1
• •	16
II. The Influence of Theophylline Upon the Absorption of Mercu- purin and Salyrgan from the Site of Intramuscular Injection. Arthur C. DeGraff, Roberts C. Batterman, and Robert A. Lehman	26
	37
V. The Fate of Drugs Used in Spinal Anaesthesia. Kenneth Bullock	38
VI. Gastrointestinal Administration of Sobisminol: Absorption,	_
Distribution and Excretion of Bismuth. P. J. Hanzlik, A. J.	•
Lehman, A. P. Richardson and W. Van Winkle, Jr	54
II. The Local Anesthetic Actions of Two Esters of Mono Alkylated	
Amino Alcohols. David I. Abramson and Samuel D. Gold-	
	69
II. Studies on the Mechanism of Morphine Hyperglycemia. The Rôle of the Sympathetic Nervous System with Special Refer- ence to the Sympathetic Supply to the Liver. R. C. Bodo,	
	88
IX. Studies of Chronic Morphine Poisoning in Dogs. VII. Effect of Thyroid Feeding on the Excretion of Morphine in Tolerant	
and Non-Tolerant Dogs. O. H. Plant and D. Slaughter 10	Œ
X. The Effect of Benzedrine Sulfate on the Emptying Time of the	
Human Stomach. Edward J. Van Liere and Clark K. Sleeth. 1. KI. The Influence of Digitalis Glucosides on the Force of Contraction	11
of Mammalian Cardiac Muscle. McKeen Cattell and Harry Gold	16
Number 2, February, 1938	
NUMBER 2, FEBRUARI, 1900	
II. The Identification of the Active Crystalline Substance from Liver Which Protects Against Liver Damage Due to Chloroform or Carbon Tetrachloride; and a Study of Related Compounds.	
R. C. Neale and H. C. Winter	27
tective Effect on Acetyl Choline and Epinephrine. Sinisha B. Bogdanovitch and Henry G. Barbour	49

s	ne Pharmacological Action of Deuterium Oxide. IV. The ympathomimetic Action of Deuterium Oxide in Mice. Henry	
XV. Son	Barbour and Julian B. Herrmann	15
	Pavid W. Fassett	16
A M G	cetyl-B-Methyl Choline Chloride (Mecholyl) and Benzyl lethyl Carbinamine Sulphate (Benzedrine Sulphate) on the all Bladder. James Flexner, Maurice Bruger and Irving S.	
	Vrightdies of Cyclopropane. IV. Cardiac Output in dogs Under	174
C	yclopropane Anesthesia. Benjamin H. Robbins and James E. Baxter, Jr.	179
XVIII. Nor	-Epinephrine [β-(3,4-Dihydroxyphenyl)-β-Hydroxyethyla- nine] as a Possible Mediator in the Sympathetic Division of the utonomic Nervous System. C. M. Greer, J. O. Pinkston, J.	
H	I. Baxter, Jr. and E. S. Brannon	189
A	roscopic Observations of Pulmonary Artery Reactions.  lbert J. Gilbert	228
	actions of Carotid Arteries of Small Animals. Torald Sollann and A. J. Gilbert	236
fr	Relative Activity of Various Purified Products Obtained om American Grown Hashish. R. P. Walton, L. F. Martin and J. H. Keller	239
XXII. The	Toxicity and Anesthetic Potency of Some New Benzoyl Devatives. R. F. Silvers and A. R. McIntyre	
	Number 3, March, 1938	
	Assay of Gonad Stimulating Preparations. M. C. D'Amour nd F. E. D'Amour	263
ts	nbutal Anesthesia. III. The Median Lethal Dose of Nembul (Pentobarbital Sodium) for Young and Old Rats.  mmett B. Carmichael	284
XXV. The	Pharmacological Action of Deuterium Oxide. V. A Calrigenic Saturation Level and the Influence of Ergotoxine. enry G. Barbour and Lillie E. Rice	
XXVI. Nat	cure of Acquired Tolerance to Alcohol. Henry W. Newman and Arnold J. Lehman	
XXVII. The	Rat in the Assay of Cortin. Fred E. D'Amour and Dorothy unk.	
XXVIII. Ans	llysis of the Circulatory Actions of Ethylnorsuprarenin. W.	
	I. Cameron, J. M. Crismon, L. J. Whitsell, and M. L. Tainter  Action of Merthiolate on the Gonadotropic Effect of Anterior	318
	ituitary Extract. Graham Chen and H. B. van Dyke	333
	erance and Fate of the Pressor Principle of Posterior Pituitary	

CONTENTS V

XXXI. The Pharmacological Action of Deuterium Oxide. VI. Its	
Influence upon the Insensible Water Loss. Henry G. Barbour	
and Lillie E. Rice	363
XXXII. Sobisminol: Toxicity, Tolerance and Irritation According to	
Different Channels of Administration. P. J. Hanzlik, A. J.	
Lehman and A. P. Richardson	372
XXXIII. Continued Voluntary Drinking of Sobisminol: General Effects.	
P. J. Hanzlik and A. J. Lehman	389
XXXIV. Excretion of Bismuth After Intramuscular Injection of Sobis-	
minol: Experimental and Clinical Results. P. J. Hanzlik, A.	
J. Lehman and A. P. Richardson	404
XXXV. Intramuscular Injection of Sobisminol: Absorption and Dis-	
tribution of Bismuth. P. J. Hanzlik, A. J. Lehman and A. P.	
Richardson	413
XXXVI. Effects of Prostigmin and Atropine on the Human Stomach. H.	
O. Veach, B. R. Lauer, and A. G. James	422
XXXVII. A Basis for The Acetylcholine Action of Choline Derivatives.	
R. R. Renshaw, D. Green and M. Ziff	430
XXXVIII. The Action of Acetyl-Beta-Methylcholine Chloride (Mecholyl)	
in Neurogenic Disturbances of The Urinary Bladder, With a	
Note On the Mechanism of Spinal Shock. Paul M. Levin	449
XXXIX. The Influence of Ouabain on The Contraction of Striated Muscle.	
McKeen Cattell	459
XL. The Relation of Acetanilid And other Drugs To Analgesia in	
Monkeys. Paul K. Smith	467
XLI. Index	475

ILLUSTRATIONS	
Graph of changes observed following intravenous injection of digitalis in divided doses in anesthetized dog with liver in circuit, and arterial pressure level high (fig. 1)	7
of changes observed following continuous intravenous injection of digitalis in anesthetized dog with liver in circuit and arterial pressure	
high (fig. 2)	7
low (fig. 3) of changes observed following continuous intravenous injection of digi-	8
talis in anesthetized dog with liver out of circuit and arterial pressure high (fig. 4)	9
digitalis in anesthetized dog with liver out of circuit and arterial pressure low (fig. 5)	9
Photograph of flowmeter (fig. 6)	12 17
volume (fig. 1)	18
carotis interna and arteria mesenteric inferior (fig. 3)	19
nin (fig. 4)	20 21
of bulbocapnin and papaverin on isolated rabbit's intestine (fig. 6) of bulbocapnin on vascular reflexes in ear of nonanesthetized rabbit	23
(fig. 7)	23
lar injection (fig. 1)showing mean percentage absorption of salyrgan with theophylline and	32
of salyrgan at various time intervals after intramuscular injection (fig. 2)	33
procaine HCl (fig. 1)	46 47
Tutocaine concentrations in cerebro-spinal fluid (fig. 3)	48 57
Action of ouabain in various concentrations on systolic tension of isolated	113
papillary muscles (fig. 1)	120

## ILLUSTRATIONS

Influence of digitalis on cardiac muscle (fig. 2)	120
Augmentation of systolic tension produced by solution of digitoxin (fig. 3)	122
Section from liver of control rat subjected to chloroform anesthesia (fig. 1)	136
— from liver of rat from same experiment but which received sodium xan-	100
	100
thine prior to anesthesia (fig. 2)	136
from liver of control rat receiving carbon tetrachloride anesthesia	
(fig. 3)	136
- from liver of rat receiving carbon tetrachloride anesthesia but which was	
protected with sodium xanthine (fig. 4)	136
- from liver of rat subjected to carbon tetrachloride anesthesia (fig. 5)	
— from liver of rat from same experiment which received guanine prior to	100
	100
carbon tetrachloride anesthesia (fig. 6)	139
- from liver of rat receiving same anesthesia as those represented by	
figures 6 and 7, but which received one protective dose of guanosine	
before anesthesia (fig. 7)	139
—— from liver of rat subjected to carbon tetrachloride anesthesia and killed	
later (fig. 8)	142
— from liver of rat subjected to same anesthesia as control rat in figure	
8, but which received hypoxanthine before anesthesia was administered	
	1 40
(fig. 9)	142
— from liver of rat from same experiment as those represented in figures 8	
and 9, but which received two protective doses of uracil prior to anes-	
thesia (fig. 10)	142
Potentiation of acetyl choline by heavy water (fig. 1)	150
Reinforcement and persistence of acetyl choline action in 20 per cent D20 bal-	
ance solution (fig. 2)	151
Effects of exposing acetyl choline solutions to fundulus scales for various	101
	1 50
lengths of time (fig. 3)	153
Protective action of heavy water upon weak epinephrine solutions exposed	
to scales; persistence of scale-treated epinephrine after evaporation of	
"protective" heavy water (fig. 4)	154
Two mice about one-fifth saturated with deuterium oxide (fig. 1)	160
Mouse about one-fifth saturated with deuterium oxide showing exophthalmos	
and general pilomotor stimulation in profile (fig. 2)	160
	162
Effect of acetyl-B-methyl choline chloride (mercholyl) and of benzyl methyl	102
	170
Carbinamine sulphate (benzedrine sulphate) on gall bladder (fig. 1)	170
binamine sulphate (benzedrine sulphate) on gall bladder (fig. 2)	177
Records of arterial pressure from three experiments in which response to	
l-epinephrine and dl-nor-epinephrine was compared with that to hepatic	
nerve stimulation (fig. 1)	199
Pressor responses to l-epinephrine, dl-nor-epinephrine, and hepatic nerve	
stimulation before and after ergotoxine (fig. 2A)	202
	200
Records of blood pressure and iris with l-epinephrine, dl-nor-epinephrine,	•
dl-arterenol, and hepatic nerve stimulation (fig. 3)	204

Records of blood pressure, iris and non-pregnant uterus with l-epinephrine, dl-nor-epinephrine, and hepatic nerve stimulation (fig. 4)	205
<ul> <li>of blood pressure and nictitating membrane with l-epinephrine, dl-nor-epinephrine, and hepatic nerve stimulation (fig. 5)</li> <li>of blood pressure and nictitating membrane with l-epinephrine, dl-nor-</li> </ul>	207
epinephrine, and hepatic nerve stimulation (fig. 6)	208
brane and blood pressure to l-epinephrine and dl-nor-epinephrine (fig. 7).	
Non-pregnant uterus of rat in Locke's solution (fig. 8)	
Records of duodenum and blood pressure with l-epinephrine, dl-nor-epine-	
phrine, and hepatic nerve stimulation (fig. 9)	
two cats under dial anesthesia (fig. 10)	
Rabbit duodenum in Locke's solution; duodenum of kitten (fig. 11)	
Photomicrographs of pulmonary artery reactions (figs. 1 and 2)	
— of pulmonary artery reactions (fig. 3)	
— of pulmonary artery reactions (figs. 4 and 5)	
Fresh carotid of cat (fig. 1)	
Carotid from same cat (fig. 2)	
Same artery as in figure 2 (fig. 3)	
Activity of cannabis preparations (figs. 1 and 2)	
— of cannabis preparations (figs. 3 and 4)	
Assay of gonad stimulating preparations (fig. 1)	
— of gonad stimulating preparations (fig. 2)	
— of gonad stimulating preparations (fig. 4)	
— of gonad stimulating preparations (fig. 5)	272
— of gonad stimulating preparations (fig. 6)	274
— of gonad stimulating preparations (fig. 7)	
Median lethal dose of nembutal for young and old rats (fig. 1)	
Calorigenic effect of 40 per cent D <sub>2</sub> O (fig. 1)	293
—— effect of 100 per cent D <sub>2</sub> O (fig. 2)	
Relation of metabolism to specific gravity of insensibly lost water (fig. 3)	
Plateau of metabolism increased under deuterium oxide interrupted by ad-	
dition of ergotoxine ethanesulfonate to morning dose of deuterium oxide	
(fig. 4)	297
65 days (fig. 5)	200
Relationship of blood alcohol concentration to degree of drunkenness in ab-	200
stinent and habituated dogs (fig. 1)	303
Alcohol concentration of blood and brain after intravenous injection in rats	
(fig. 2)	305
Rat in assay of cortin (graph 1)	312
Relative constrictor potency of ethylnorsuprarenin and epinephrine for	
perfused cat's leg (fig. 1)	322
Cardiac stimulation in heart-lung preparation by equivalent doses of ethyl-	204
norsuprarenin and epinephrine (fig. 2)	0 <i>4</i> /2

Constriction of excised hepatic veins by ethylnorsuprarenin and epinephrine	
and relaxation by nitroglycerine (fig. 3)	
Changes in venous and arterial pressures, intestinal, leg and liver volumes	
in cat receiving ethylnorsuprarenin intravenously (fig. 4)	326
- in arterial and portal pressures and leg volume from ethylnorsuprarenin	
intravenously in cat (fig. 5)	327
— in arterial pressure, leg volume, heart volume and pulse rate in cat	
receiving ethylnorsuprarenin intravenously (fig. 6)	306
in leg volume and blood pressure, showing dilatation, then constriction	020
in leg volume and blood pressure, snowing distation, then constriction	
of leg after ethylnorsuprarenin in comparison with responses to nitro-	000
glycerine and epinephrine (fig. 7)	329
Action of merthiolate on gonadotropic effect of anterior pituitary extract	
(figs. 1 and 2)	334
Changes in microscopic appearance of ovaries of rats following administra-	
tion of pituitary gonadotropic extract with or without merthiclate	
(fig. 3)	339
- in microscopic appearance of uteri and vaginae of rats following ad-	
ministration of pituitary gonadotropic extract with or without mer-	
thiolate (fig. 4)	340
- in microscopic appearance of epithelium of seminal vesicles of rats	
following administration of pituitary gonadotropic extract with or with-	
out merthiolate (fig. 5)	249
Composite diagram of blood pressure, spleen volume and volume of about	072
one-third of small intestine of cat (barbital and ether anesthesia) re-	050
• • • • • • • • • • • • • • • • • • • •	
Tolerance of anesthetized dogs and cats for pituitary extract (figs. 2 to 5).	353
Amounts of urine and posterior pituitary eliminated by anesthetized cats	
and dogs receiving pituitary extract intravenously (fig. 6)	355
Relation of insensibly lost water to CO <sub>2</sub> output (fig. 1)	365
between water lost insensibly and CO2 output during administration of	
deuterium oxide (fig. 2)	367
	367
Changes in metabolism and water loss following ergotoxine given on sixth	
	369
Temperatures of mice becoming gradually saturated by various courses	
of deuterium oxide (fig. 5)	370
Continued drinking of water (control) and of diluted solvent in sobisminol	•••
by white rats (fig. 1)	391
	392
— drinking of unferent dilutions of sobisminol by white lats (lig. 2) — drinking of solvent and different dilutions of sobisminol by rabbits	052
	202
· · · ·	393
Bismuth-balance chart after intramuscular injection of therapeutic doses	400
	408
Clinical urinary excretion of bismuth after intramuscular injection of sobis-	
Effects of prostigmin and atropine on human stomach (fig. 1)	
— of prostigmin and atropine on human stomach (fig. 2)	425

## ILLUSTRATIONS хi Effects of prostigmin and atropine on human stomach (figs. 3 and 4) ..... 426 Measurement of evanescence in absence of nicotine action, measurement of evanescence in presence of nicotine action (figs. 2a and 2b)...... 433 Similarity of effect of eserine on activity of ethoxycholine and acetylcholine Showing presence of blood-labile substance in heart blood of cat receiving Effect of mecholyl on bladder of normal cat; nembutal anesthesia (fig. 1).... 450 of mecholyl on bladder of cat seven days after section of posterior sacral -- of mecholyl on bladder of cat two days after section of all sacral roots; - of mecholyl on bladder of cat after transection of spinal cord at upper Changes in twitch tension and efficiency following exposure to ouabain, and - in twitch tension following exposure to ouabain, with reversal following Monkeys in position for mechanical and electrical stimulation and recording Some effects in monkeys of acetanilid, caffeine and morphine (fig. 2)...... 472