BIBLIOGRAPHY
OF
SUPRARENALUM

BY

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A THESIS SUBMITTED FOR THE DEGREE OF

BACHELOR OF SCIENCE

(Pharmacy)

UNIVERSITY OF WISCONSIN

1938

Lehmen, G.F. 1813

(An Inquiry into the Use of the Capsulae Renales.)

Med. Reposit., 1, p. 137. (Index Catalogue of L.S. O.S., v. 13, p. 891.)

The original was not available.

Mitchell, T.D. 1813

(The Functions of the Supra-renal Glands.)

Med. Reposit., 1, p. 241. (Index Catalogue of L.S.G.O.S., v. 13, p. 891.)

The original was not available.

Virchow, R. 1857

Zur Chemie der Nebennieren.

Virchow's Arch. f. path. u. Anat., 12, p. 481. (Index Catalogue of L.S.G.O.S., 1, v. 13, p. 897.)

Describes a few color reaction tests of the adrenal gland.

Seligsohn,_____. 1860

Zur Chemie der Nebennieren.

Virchow's Arch.f.path.u. Anat., 18, p. 355. (Index Catalogue of L.S.G.O.S., 1, v. 13, p. 892.)

Describes some chemical properties of the suprarenal gland.

Krukenberg, C.Fr.W. 1885

Die farbigen Derivate der Nebennieren-chromogene.

Virchow's Archiv., 101, p. 542. (Johns Hopkins Hosp. Bull., 12, p. 80.)

Precipitates epinephrine with ammonia and in a lead or zinc solution.

Churton, T. 1886

On the Effects of Total and of Partial Destruction of the Suprarenal Bodies.

Lancet, 1, p. 245. (Index Catalogue of L.S.G.O., S., v. 13, p. 891.)

Describes cases in which the patients had disease of the adrenal glands and also described symptoms.

Brunner, von H. 1892

Zur Chemie der Lecithine und des Brenzcatechins, Bestandtheile der Nebennieren.

Schweiz. Wochenschr.,f. Pharmacie, 30, p. 121. (Am. Journ. Pharm., 75, p. 302.)

Found that an alcoholic extract of the adrenal gland could be made to give nearly all the reactions of pyrocatechin:- green color with ferric chloride, reducing silver nitrate at room temperature and Fehling's solution on boiling.

Schäfer, A. & Oliver, E.A. 1894

On the Physiological Action of Extract of the Suprarenal Capsules.

Journ. Physiol., 16, p. 1. (Am. Journ. Pharm., 75, p. 301.)

The suprarenal capsules yield a substance which has a powerful action upon blood vessels, heart, and skeletal muscles. It causes extreme contraction of the arteries so that blood pressure is raised.

Stuart, C.E. 1894

Animal Extracts.

Yrbk. Brit. Pharm.Conf., 31, p. 421.

Discussed extracts of the different glands; including the suprarenals of which is told its position in the body, description and how to make the extract.

Gluzinski, L.A. 1895

Ueber die Physiologische Wirkung der Nebennierenextracte.

Wiener Klin. Woch., 8, p. 251. (Revue de Therap., 42, p. 356; Yrbk. Brit. Pharm. Conf., 33, p. 163.)

Suprarenal capsules were powdered and mixed with equal parts of glycerin and water, in the proportion of 1 in 4. Injected into a rabbit, it killed the animal within a few minutes. Immediately after injection, paralysis of the hindquarters is observed, with loss of sensibility, while the fore-limbs are seized with convulsive movements; respiration is accelerated, the pupils dilate and the animal dies completely paralysed.

Oliver, G. & Schäfer, E.A. 1895

The Physiological Effects of Extracts of the Suprarenal Capsules.

Journ. Physiology, 18, p. 230. (Remington & Wood, Dispens. U.S.Am., 20 ed., p. 94; Am. Journ. Pharm., 75, p. 301.)

The intravenous injection of the extract of the suprarenal capsule brought about a marked rise in blood pressure.

Oliver, G. & Schäfer, E.A. 1895

On the Physiological Action of Extract of the Suprarenal Capsules.

Proc. Physiol Soc., 17, p. 9. (Journ. Chem. Soc., 68, p. 235; Yrbk. Brit. Pharm. Conf., 32, p. 175.)

An aqueous, dilute alcoholic, or glycerol extract of suprarenal capsules, when intravenously injected in dogs or rabbits, produces 1:- an extreme contraction of the arteries; 2:- a rise of arterial pressure; 3:- central uagus stimulation leading to standstill of the auricles; 4:- acceleration and augmentation of the heart's beat; 5:- respiration becoming slightly shallower.

Mühlmann, M. 1896

Zur Physiologie der Nebenniere.

Deutsche Med. Wochenschr., 22, p. 409. (Am. Jour. Pharm., 75, p. 302.)

Stated that pyrocatechin was not present as such in the adrenal gland, but in a form combined with the active principle, from which it may be split off by boiling with dilute hydrochloric acid.

Abel, J.J. & Crawford, A.C. 1897

On the Blood-Pressure-Raising Constituent of the Suprarenal Capsule.

Johns Hopkins Hosp. Bullet., 8, p. 151. (Am. Journ. Pharm., 75, p. 303.)

Showed that the active principle of the gland could be precipitated from an aqueous extract of the gland by treating with benzoyl chloride and sodium hydrate.

Fürth, O. von 1897

Zur Kenntniss der brenzkatechinähnlichen Substanz in den Nebennieren I.

Zeitschrift. f. Physiol. Chem., 24, p. 337. (Johns Hopkins Hosp. Bull., 12, p. 337.)

Assumed the blood-pressure-raising-constituent to be either tetrahydrodioxypyridine, $C_5H_9NO_2$, or dihydrodioxypyridin, $C_5H_7NO_2$; the assumption was based on a series of analyses of an impure acetyl product prepared from extracts of the adrenal gland.

Moore, B. 1897

On the Chromogen and on the Active Physiological Substance of the Suprarenal Gland.

Journ. Physiol., 21, p. 382. (Am. Journ. Pharm., 75, p. 304.)

Claimed that extracts of the suprarenal gland did not reduce Fehling's solution.

Abel, J.J. 1898

On Epinephrin, the Active Constituent of the Suprarenal Capsule and its Compounds.

Proc. Am. Physiol. Soc., 2, p. 3. (Yrbk. Brit. Pharm. Conf., 36, p. 85.)

Described the chemical and physiological properties of epinephrin.

Cohen, S.S. 1898

A Preliminary Note on the Treatment of Hay Fever with Suprarenal Substance: With a Report of Personal Experience.

Philadelphia Med. Journ., 2, p. 341. (Yrbk. Brit. Pharm. Conf., 36, p. 187.)

Coryza and sneezing were stopped by taking tabloids, representing 5 grains of suprarenal substance. The contraction of the vessels of the nasal mucous membrance would thus account for the relief experienced. He experimented upon himself.

Fürth, O. von. 1898

Zur kenntniss der brenzcatechirahnlichen Substanz der Nebennieren II.

Zeitschr. f. Physiol. Chem., 26, p. 15. (Johns Hopkins Hosp. Bull., 12, p. 337.)

Reports that epinephrine does not reduce Fehling's Solution.

Abel, J.J. 1899

On the Phenylcarbamic Esters of Epinephrin.

Amer. Journ. Physiol., 3, p. 17. (Johns Hopkins Hosp. Bull., 12, p. 80.)

The general formula for the formation of esters of phenyl carbamic acid is:-
$(R)OH + CO.N.C_6H_5 = (R)O.CO.NH.C_6H_5$.

Abel, J.J. 1899

Ueber den Blutdrukerregenden Bestandtheil der Nebenniere, das Epinephrin.

Zeitschrift. f. physiol. chem., 28, p. 318. (Am. Journ. Pharm., 75, p. 304; Johns Hopkins Hosp. Bull., 13, p. 35.)

Separated the benzoyl-chloride of a base from the suprarenal capsule and named it epinephrine.

Grünbaum, O.F.F. 1899

A Note on the Effect of the Administration of Suprarenal Gland by the Mouth in Health and Disease.

Proc. Physiol. Soc., 24, p. 24. (Index Catalogue of L.S. G.O., S.a, v. 17, p. 81.)

Found that in the administration of suprarenal extract, if the active principle were not absorbed sufficiently rapidly to cause a rise in blood-pressure, is an ideal haemostatic in cases of hemorrhage from the walls of the alimentary canal or bladder.

Bates, W.H. 1900

Suprarenal Therapy.

Med. News, 76, p. 441. (Brit. Med. Journ. Epit., 1900, x, p. 96; Pharm. Journ., 65, p. 57; Proc. Am. Pharm. Assoc., 49, p. 919.)

States that suprarenal extract acts as a local astringent, vascular constrictor and a powerful cardiac stimulant.

Bates, W.H. 1900

Therapeutic Properties of the Suprarenal Capsule.

West Drugg., 22, p. 544. (Proc. Am. Pharm. Assoc., 49, p. 918.)

Discusses the therapeutic properties of suprarenal extract as formulated from his own observations.

Fürth, O. von. 1900

Zur Kenntniss der brenzcatechinähnlichen Substanz der Nebennieren.

Zeitschr. f. physiol. Chem., 29, p. 105. (Johns Hopkins Hosp. Bull., 12, p. 80.)

The method of isolating epinephrine by means of ammonia is described.

Hunt, R. 1900

Note on a Blood-Pressure Lowering Body in the Suprarenal Gland.

Proc. Am. Physio.Soc., 3, p. 18. (Index Catalogue of L.S.G.O., S.2, v.17, p. 81.)

Examined crystalline material obtained from an aqueous extract of the suprarenal glands from which epinephrin had been romoved and which no longer gave a rise of blood pressure. Described chemical and physiological properties of the crystals.

Abel, J.J. 1901

Further Observations on Epinephrin.

Johns Hopkins Hosp. Bullet., 12, p. 80. (Am. Journ. Pharm., 75, p. 306.)

Discusses properties of the various salts of epinephrin.

Abel, J.J. 1901

On the Behavior of Epinephrin to Fehling's Solution and Other Characteristics of this Substance.

Johns Hopkins Hosp. Bullet.,12, p. 337. (Am. Journ. Pharm., 75, p. 307.)

Reported that epinephrin in its native state reduces silver nitrate and other metallic salts, but does not reduce Fehling's Solution.

Anel, J.J. 1901

Outline of A Method for the Quantitative Estimation of Epinephrin by Colorimetric Comparisons.

Johns Hopkins Hosp. Bull., 12, p. 342. (Am. Journ. Pharm., 83, p. 552.)

In testing an aqueous solution of epinephrine with ferric chloride, the green color could be made more permanent by the addition of an excess of potassium benzene thiosulfate.

Aldrich, T.B. 1901

A Preliminary Report on the Active Principle of the Suprarenal Gland.

Am. Journ. Physiol., 5, p. 457. (Am. Journ. Pharm., 75, p. 308.)

Prepared the principle in both active and crystalline forms using either ammonia or sodium carbonate as the precipitating agent.

Houghton, E.M. 1901

The Pharmacologic Assay of Preparations of The suprarenal Glands.

Proc. Am. Pharm. Assoc., 49, p. 351.

Outlined the results of his experiments with dogs which had been injected with adrenalin solution. The blood pressure of these animals was traced.

Hunt, R. 1901

On the Effects of Intravenous Injections of Minimal Doses of Epinephrin Sulfate upon the Arterial Blood-Pressure.

Am. Journ. Physiol., 5, p. 7; (Johns Hopkins Hosp. Bull., 12, p. 80; Ibid., 13, p. 33.)

Prepared epinephrine sulfate from a basic lead acetate; found that it is many times more powerful physiologically than the aqueous extracts of the medulla of the suprarenal gland.

Maben, T. 1901

Notes on Adrenalin.

Pharm. Journ., 66, p. 361. (Yrbk. Brit. Pharm. Conf., 38 ,p. 130.)

Describes the physical properties and a few chemical properties of the active principle of the suprarenal gland. Says that the chemical constitution has not yet been determined. The solution of the extract has the great advantage of accurate dosage.

Peters, E.A. 1901

Four Cases in Which Pain was Relieved by Suprarenal Extract.

Lancet, 79, p. 619. (Pharm. Journ., 66, p. 391; Am. Pharm. Assoc. Proc., 49, p. 919.)

Reports 4 cases in which distressing pain was relieved by the local application of a 10% solution of suprarenal capsules.

Schafer, A.E. 1901

On Certain Practical Applications of Extract of Suprarenal Medulla.

Brit. Med. Journ., 1901, 1, p. 1009. (Yrbk. Brit. Pharm. Conf., 38, p. 170.)

States that a solution of suprarenal medulla is most active agent for stimulating or causing uterine contraction; in post partum it is more advantageous to inject it directly into the uterine cavity, altho' it could be administered by mouth as the active principle is unaffected by the gastric secretion.

Takamine, J. 1901

The Blood-Pressure-Raising Principle of the Suprarenal Glands - A Preliminary Report.

Ther. Gazette, 25, p. 221. (Am. Journ. Pharm., 75, p. 308.)

Prepared a crystalline preparation of the active principle of the suprarenal gland by a very simple method based on his observation that ammonia precipitates the active principle from an aqueous extract of the adrenal gland. He named the preparation adrenalin.

Takamine, J. 1901

Adrenalin the Active Principle of the Suprarenal Glands and its Mode of Preparation.

Am. Journ. Pharm., 73, p. 573. (Yrbk. Brit. Pharm. Conf.,39, p. 22; Proc. Am. Pharm. Assoc., 50, p. 1083; Wood & LaWall, Dispens. U.S.Am., 21 ed., p. 431.)

Discusses the preparation of and describes adrenalin in the pure crystalline form.

Abel, J.J. 1902

On a Simple Method of Preparing Epinephrin and its Compounds.

Johns Hopkins Hosp. Bullet., 13, p. 29. (Am. Journ. Pharm., 75, p. 310 & 307.)

Found that adrenalin as prepared by the zinc ammonia process, washed free of ammonia, and dried over sulfuric acid would be stable as long as it is kept perfectly dry.

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v.Fürth, O. 1902

Zur kenntniss des Suprarenins.

Beträge zur chem., Physiol.u. Pathol., 1, p. 243. (Am. Journ. Pharm., 75, p. 305; Johns Hopkins Hosp. Bull., 13, p. 29.)

Abandoned the theory that the blood-pressure-raising- constituent might be wither tetrahydrodioxy-pyridine, $C_5H_9NO_2$, or dihydrodioxypyridine, $C_5H_7NO_2$.

Abel, J.J. 1903

On Epinephrin and its Compounds, with Especial Reference to Epinephrin Hydrate.

Am. Journ. Pharm., 75, p. 301. (Proc. Am. Pharm. Assoc., 52, p. 975; Wood, Remington & Sadtler, Dispens. U.S. Am., 19 ed., p. 583.)

Claims that his product is the purest of the preparation so far found; named it epinephrin hydrate and assigned to it the formula $C_{10}H_{13}NO_2+\frac{1}{2}H_2O$.

Amberg, S. 1903

Ueber die Toxicität des wirksamen Princips der Nebennieren.

Archives internat.de Pharmacodynamie et de Therapie, 11, p. 79. (Am.Journ.Pharm., 75, p. 317.)

Reported that Adrenalin, in the form of a sulfate, after dehydration lost its local vaso-constricting action, but it is not lacking in all of its other physiological activities.

Black, D. 1903

Dispensing Notes.

Pharm.Journ., 70, p. 484. (Yrbk.Brit.Pharm.Conf.,40, p. 261.)

Lists prescriptions containing adrenaline and incompatable substances such as *lead acetate with which it forms a reddish flocculent precipitate. *Other prescriptions are described as well as methods for filling them.

Graeser, _____. 1903

Adrenalin gegen Darmblutung bei Typhus.

Muench.Med.Woch., 50,II,p.1294.(Brit.Med.Journ. Epit., 1903,II, p.75;Yrbk.Brit.Pharm.Conf., 41, p. 188.)

30 drops of adrenaline hydrochloride solution administered in a saline draught every 3 hours, has enabled the author to arrest severe haemorrhage in typhoid fever.

Josue,M. 1903

La Vaso-Constriction Determinee Par L'Adrenaline n'est pas due aux Centres Sympathiques.

Compt. rend.Soc.Biol.de Paris, 55,p.30.(Wood & LaWall, U.S.Am.Dispens., 21 ed., p. 432.)

Reports the results after repeated injections of adrenalin upon a rabbit.

Mansier, M. 1903

Poudre Soluble d'Adrenaline et Solution citro-boriquee d'adrenaline.

Rep. de Pharm., 15, p. 481. (Yrbk. Brit. Pharm. Conf., 41, p. 260; Schweiz. Woch. f. Chem. u. Pharm., 42, p. 46; Am. Journ. Pharm., 76, p. 137.)

A method of getting adrenaline into a convenient form for dispensing is given:- a powder containing adrenaline, citric acid and boric acid is made. This powder is soluble in water, and may be used whenever adrenaline is prescribed in solution or in an ointment.

Wegrich, E. 1903

Die Blutsteigernde Substanz der Nebennieren: das "Suprarenin".

Pharm. Post, 36, p. 568. (Schw. Wchschr. f. Chem. u. Pharm., 42, p. 200; Proc. Am. Pharm. Assoc., 52, p. 975.)

Describes the physical and chemical properties of the active principle of the suprarenal capsule, supplied in Germany in commerce under the name of "Suprarenin".

Bardier, E. & Baylac, J. 1904

De l'action de l'adrenaline sur la pression sanguine des animaux atropinises.

Compt. rend. d. Soc. d. Biol., 57, p. 485. (Index Catalogue of L.S.G.O., s.2, v. 17, p. 80.)

Normally the injection of adrenaline provokes a slowing of the heart and at the same time an elevation of the blood pressure. Atropine stops the production of the slowing action.

Bose, R.B.K. 1904

Adrenalin Chloride in Plague.

Adrenaline has value, given internally, in arresting severe pulmonary haemorrhage; also has value in the treatment of post-partum haemorrhage.

Jowett, H.A.D. 1904

The Constitution of Epinephrine.

Proc. Chem. Soc., 20, p. 18. (Yrbk. Brit. Pharm. Conf., 41, p. 78; Chem. & Drugg., 64, p. 276; Pharm. Journ., 72, p. 247; Proc. Am. Pharm. Assoc., 52, p. 974; Wood, Remington & Sadtler, Dispens. U.S.Am., 19 ed., p. 583.)

Agrees with Aldrich as that the formula of epinephrine as $C_9H_{13}NO_3$.

Mathieu, X. 1904

Action de l'adrenaline sur le coeur.

Journ. de physiol. et de path. gen., 6, p. 435. (Index Catalogue of L.S.G.O., S.2, v. 17, p. 87.)

Discussed the fact that the extract of the suprarenal capsules upon the heart is well-known but that the origination of the pulsations has not been explained. After experimentation, he came to the conclusion that the effect upon the heart is an excitation of the "centres bulbaires" on the one hand and on the other hand as peripheral action.

Pauly, H. 1904

Zur kenntniss des Adrenalins II.

Berichte der deut. chem. Gesellsch., 37, p.1388 (Merck's Rep., 13, p. 361; Proc. Am. Pharm. Assoc., 53, p. 849.)

Supports the formula $C_9H_{13}NO_3$; and shows by experiments that adrenalin contains no water of crystallization.

Stolz, F. 1904

Ueber Adrenalin und Alkylaminoacetobrenz-catechin.

Berich. d. Deutsch. Chem. Gesell., 37, p. 4149. (Wood & LaWall, Dispens. U.S.Am., 21 ed., p. 430.)

A synthetic compound was prepared; it differed from the natural alkaloid in that it was optically inactive and weaker physiologically.

Voigt, B. 1904

Ueber Anwendung und Wirkung des Adrenalins Amkrankenbett.

Pharm. Ztg., 50, p. 220. (Munchn. Med. Wochenschr.,1, pp. 662 & 757; Zeits. d. All. Oest. Apoth. Ver., 43, p. 325; Am. Journ. Pharm., 77, p. 288.)

Recommends that the dose of 0.00009 Gm. should not be exceeded. Quantity may be increased to 0.00015 Gm. in cases where the patient is under the influence of an anesthetic.

Abelous, J.E., Soulie, A. & Toujan, G. 1905

Dosage Colorimetrique par L'Iode de L'Adrenaline.

Compt. rend. soc. biol., 58, p. 301. (Am. Journ. Pharm., 83, p. 557.)

Used the iodine test in the colorimetric analysis of epinephrine solution; excess of iodine was measured with thiosulfate.

Aldrich, T.B. 1905

Adrenalin, the Active Principle of the Suprarenal Glands.

Journ. Am. Chem. Soc., 27 , p. 1074. (Pharm. Ztg., 50, p. 1019; Proc.Am. Pharm. Assoc., 54, p. 954.)

Supports the claim that the empirical formula for adrenalin is $C_9H_{13}O_3N$; and that adrenalin contains a pyrocatechin complex, an asymmetric carbon atom, 3 OH groups, one of which is contained in the side chain and a CH_3N group.

Bierry, H. & Gatin-Gruzewska, Z. 1905

Action physiologique de l'adrenaline pure.

Compt. rend. d. Soc. de Biol., 58, p. 902. (Index Catalogue of L.S.G.O., S.2, v. 17, p. 80.)

Described several experiments carried out with pure adrenalin using dogs as subjects.

(Editor) 1905

(Proprietary Names for Epinephrin.)

Am. Journ. Pharm., 77, p. 45.

At a pharmaceutical meeting at the Philadelphia College of Pharmacy a list of about 20 names were given that were in use for Adrenalin.

Foa, C. & Gutin-Gruzewska, Z. 1905

Action de l'adrenaline pure sur la reaction du sang.

Compt. rend. d. Soc. Biol., 59, p. 145. (Index Catalogue of L.S.G.O., S.2, v. 17, p. 81.)

Tested for acid in the urine of dogs and rabbits after being injected with adrenalin; also tested blood.

Elliot, T.R. & Durham, H.E. 1906

On Subcutaneous Injections of Adrenalin.

Journ. Physiol., 34, p. 490. (Index Catalogue of L.S. G.O., S.2, v. 17, p. 81.)

The experiments were made to try the possibility of an anti-body produced by subcutaneous injections of adrenalin, and to observe whether any great change appeared at the same time in the nerves and muscles of the sympathetic system. It was found that no substance was formed in the blood which exerted an abnormal influence on the blood vessels of normal cats; no trace of anti-adrenalin was found present in the blood. Nor was a substance present to any extent in the tissues themselves, which made them much less responsive to the stimulant action of adrenalin.

Sajous, C.E. de M. 1906

The Physiological Action and Uses of Adrenal Extractives.

New York Med. Journ., 84, p. 1109. (Index Catalogue of L.S.G.O., S.2, v. 17, p. 82.)

Described and discussed several uses of adrenal extractives:- use to sustain bodily heat in shock, asthma accompanied by lowered vasomotor tone, migraine, hay fever, neurasthenia, cardiac weakness and Addison's disease.

Sollman, T. & Brown, E.D. 1906

The comparative Physiologic Activity of Some Commercial Suprarenal Preparations.

Journ. Am. Med. Assoc., 47, p. 792. (Index Catalogue of L.S.G.O., S.2, v. 17, p. 82.)

Found that samples of "1 to 1,000 solution of Suprarenal Alkaloid" were not of identical strength; hence it would be difficult to obtain an exact dosage.

Vanderkleed, C.E. 1906

A Method for the Preparation of Solutions of the Active Principle of the Suprarenal Gland.

Proc. Am. Pharm. Assoc., 54, p. 388. (Yrbk. Brit. Pharm. Conf., 44, p. 221.)

Gives a brief history of work on the suprarenal gland, a method for producing an active, sterile, and permanent solution of the active principle of the gland without separating the active principle in solid form at any point in the process,and some color reaction tests.

(Editor) 1907

Synthetisches Suprarenin.

Pharm. Ztg., 52, p. 466. (Proc. Am. Pharm. Assoc., 55, p. 953; Jour. d. Pharm. et Chiem.,143, p. 66; Yrbk. Brit. Pharm. Conf., 45, p. 7.)

A secondary alcohol, o-dioxyphenylaethanol-methylamine, has been found to be identical in composition and chemical properties to natural suprarenin. The editor also discusses the properties, preparation, dose, and salt of this product which had been made at the Höchster Fabwerke.

Maben, T. 1907

Adrenalin : The Active Principle of the Suprarenal Gland.

Pharm. Journ., 78, p. 388. (Proc. Am. Pharm. Assoc., 55, p. 952.)

Prefers adrenalin to epinephrin as the official name; states that adrenalin is the active principle of the suprarenal gland; points out that the name adrenalin is not a registered trade-mark.

Truner, J. 1907

Progress in the Synthesis of Adrenalin.

Proc. Am. Pharm. Assoc., 55, p. 449.

Traced the increasing interest and research being carried on by several scientists in trying to establish a formula, to succeed in synthesizing it, and to bring it to the front in pharmacy and medicine.

Aberhalden , E. & Müller, F. 1908

Über das Verhalten des Blutdruckes nach intravenöser Einführing von l-, d- und dl-Suprarenin.

Zeitschr. f. Physiol. Chem., 58, p. 185. (Wood & LaWall, Dispens, U.S.Am., 21 ed., p. 431.)

The laevo-rotatory form of the synthetic suprarenal was found to be nearly 15 times as active as the dextro-rotatory.

Cushny, A.R. 1908

The Action of Optical Isomers : Adrenalin.

Journ. Physiol., 37, p. 130. (Wood & LaWall, Dispens, U.S.Am., 21 ed., p. 431.)

The laevo-rotatory form or the natural adrenalin acts twice as strongly on the blood-pressure as the dextro-rotatory form or synthetic adrenalin.

Flächer, F. 1908

Über die Spaltung des synthetischen dl-Suprarenins in seine optisch aktiven Komponenten.

Zeitschr. f. Physiol. Chem., 58, p. 191. (Pharm. Journ., London, 28, p. 27; Am. Journ. Pharm., 81, p. 150; Wood & LaWall, Dispens., U.S.Am., 21 ed., p. 431.)

Synthetic suprarenin is always optically inactive, being a mixture of dextro- and laevo-rotatory forms. It was found that the 2 forms could be separated and that the synthetic laevorotatory form is very efficient.

Frugoni, C. 1908

Adrenalin - Glykosurie und ihre Beeinflussung durch des Extrakt und den Saft des Pankreas.

Berlin. Klinisch. Wochen., 45-II, p. 1606. (Remington & Wood, Dispens. U.S.Am., 20 ed., p. 95.)

Through an action upon the pancreas, epinephrine may give rise to a glycosuria, if given in large quantities.

Gunn, A. & Harrison, E.E. 1908

The Colouration of Adrenine Solutions.

Pharm. Journ., 80, p. 513. (Yrbk. Brit. Pharm. Conf., 45, p. 7.)

Adrenine may be dissolved in water with the aid of a smaller quantity of HCl than one molecular weight equivalent. Such a solution, even if kept out of contact with air, gradually acquires a red color. Other substances which increase the coloration are:- alkaline glass and exposure to air; exposure to light; the presence of a minute amount of a ferric salt.

Houghton, E.M. & Merrill, C.H. 1908

The Diuretic Action of Adrenalin and the Active Principle of the Pituitary Gland.

Journ.Am. Med. Assoc., 51, p. 1849. (Index Catalogue of L.S.G.O., S.2, v. 17, p. 81.)

From experiments found that the explanation of the increased urinary flow in anesthetized animals depends chiefly on the increase in blood pressure produced by the intravenous injection of the adrenalin solution or the pituitary extract in solution rather than on a specific action on the secreting cells of the kidney.

Krauss, L. 1908

Uber Einige Reaktionen des Suprarenin Syntheticum.

Apoth. Ztg., 23, p. 701. (Am. Journ. Pharm., 81, p. 150; Ibid., 83, p. 552.)

Enumerates tests and reactions for the natural active principle of the suprarenal gland and also for the synthetic product.

Meister, ____., Lucrus, _____. & Bruning,____. 1908

Synthetical Suprarenine.

Chem. & Drug., 72, p. 48. (Am. Journ. Pharm., 80, p. 143.)

Synthetic suprarenine was prepared by condensing catechol with chloracetic acid which is then treated with methylamine. The product is said to be indistinguishable from the active principle of the suprarenal gland in physiological action.

Miller, J.L. 1908

Experimental Arterioselerosis.

Journ. Am. Med. Assoc., 50, p. 1069. (Wood & LaWall, Dispens. U.S.Am., 21 ed., p. 433.)

The combined injections of "iodids" and adrenalin make animals more subject to change than adrenalin alone.

Aberhalden, E. & Thies, F. 1909

Action physiologique des suprarenines levogyre, dextrogyre et racemique.

Nouv. Remedes, 25, p. 372. (Pharm. Journ., 83, p. 795; Proc. Am. Pharm. Assoc., 58, p. 397.)

The 2 forms, laevo- and dextro-suprarenin, have different actions:- the laevo-form produces a dilation of the pupil of the eye and the dextro-suprarenin has no effect.

Cushny, A.R. 1909

Further Note on Adrenalin Isomers.

Journ. Physiol., 38, p. 259. (Wood & LaWall, Dispens. U.S.Am., 21 ed., p. 431.)

Confirms the statement concerning the greater strength of the laevo-rotatory form of adrenalin on the blood pressure.

Fränkel, S. & Allers, R. 1909

Uber eine neue charakterische Adrenalin reäktion.

Biochem. Ztschr., 18, p. 40. (Am. Journ. Pharm., 83, p. 552; Pharm. Ztg., 54, p. 530; Proc. Am. Pharm. Assoc., 58, p. 396.)

In the iodic acid test of epinephrine solutions, they recommended the addition of a few drops of dilute phosphoric acid.

Jona, J.L. 1909

(Adrenine as an Emergency Treatment in Cases of Non-Corrosive Poisoning.)

Intercolonial Med.J. Australas, ___,p._____.(Lancet, 177, p. 1012; Yrbk. Brit. Pharm. Conf., 47, p. 177.)

(From experiments performed on rabbits it seems that the administration of adrenine solution by the mouth so far hinders absorption that it is a useful antidote in the case of rapidly acting poisons. Such as KEN, and struchnine. Thus given, it arrests the action of the poison, and allows time for the administration of chemical antidotes.)

The original was not available.

Schur, H. 1909

Ueber eine neue Reaktion im Harn.

Wien. Klin. Wochenschr., 22, p. 1587. (Pharm. Zentralh., 51, p. 422; Yrbk. Brit. Pharm. Conf., 47, p. 52.)

A few drops of iodine tincture are added to the urine, and the mixture is shaken out with ethyl oxide. The presence of adrenine is shown by the appearance of a yellow color in the ethyl oxide on separation.

Wiggers, C.J. 1909

The action of Adrenalin on the Pulmonary Vessels.

Journ. Pharmacol. & Exper. Therap., 1, p. 341. (Index Catalogue of L.S.G.O., S.2, v.17, p. 83.)

Because the simultaneous influence of adrenalin on the heart cannot be eliminated, it is not possible to determine by pressure measurements in the pulmonary circuit whether or not adrenalin affects the pulmonary vessels. Found that adrenalin dissolved in a solution of the same viscosity as that with which the organ is perfused causes a constriction of the pulmonary vessels.

Zangfrognini, A. 1909

Eine neue Kolorimetrische Methode der Adrenalinbestimmung.

Deutsch. Med. Wochenschr., 35, p. 1752. (Pharm. Zeit., 54, p. 889; Yrbk. Brit.Pharm. Conf., 47, p. 2.)

A brown oxide is formed upon using potassium permanganate, water and lactic acid; but forms an intense red color reaction with adrenine.

Comessati, G. 1910

Systematische Desierungen des Nebennieren-adrenalins in der Pathologie.

Arch. Exp. Path.u.Pharm., 62, p. 190. (Am. Journ.Pharm., 83, p. 552.)

Used a mercuric chloride test, which consisted of adding saturated $HgCl_2$ to epinephrine solution and heating. The color developed upon heating was noted.

Ewins, A.J. 1910

Some Colour Reactions of Adrenine and Allied Bases,

Journ. Physiol., 40, p. 317. (Pharm. Journ., 85, p. 517; Proc. Am.Pharm.Assoc., 59, p. 518.)

Describes color reactions that have been offered by different men as tests for the identification of adrenine.

Macadie, W. 1910

The Colouration of Solution of Natural Adrenine.

Pharm. Journ., 85, p. 660. (Yrbk. Brit. Pharm. Conf., 48, p. 279.)

Direct oxidation of adrenine hydrochloride produces, after some time, a pure red color without any trace of the characteristic brown of discolored solutions. Action of an alkali on the base,atmospheric oxygen being obviously negligible, produces immediate decomposition with production of a brownish-red solution, ultimately becoming dirty brown.

Auer, J. & Meltzer, S.J. 1911

The Characteristic Course of the Rise of Blood Pressure Caused by an Intra-spinal Injection of Adrenalin.

Proc. Soc. Exper. Biol. Med., 9, p. 79. (Index Catalogue of L.S.G.O., S.3,v.9, p. 1111.)

As compared with intravenous injections which cause a rapid steep rise of blood pressure with a gradual fall, the intraspinal injection is quite slow. The blood pressure rises slowly but steadily; after reaching a maximum, it would then commence to go down very gradually. The entire course of the rise of blood pressure lasted much longer than in intravenous injections.

(Editor) 1911

The Name "Epinephrin" versus the Name "Adrenalin".

Jour. Am. Med. Assoc., 56, p. 901. (Am. Journ. Pharm., 83, p. 291.)

"It cannot be too strongly emphasized that "epinephrin" is a true scientific name for the active principle of the suprarenal gland, and that it should be used on all occasions when the active principle and not some particular firm's make is referred to."

Hale, W. & Seidell, A. 1911

Colorimetric and Physiological Estimation of the Active Principle of the Suprarenal Gland.

Am. Journ. Pharm., 83, p. 551. (Yrbk. Brit. Pharm. Conf., 49, p. 47.)

Discuss color tests of the suprarenal gland for quantitative analysis; results should be correlated with action as determined by physiological tests.

Joseph, D.R. 1911

A Quantitative Study of the Pupil dilation caused by adrenalin.

Proc. Soc.Exp.Biol. & Med., 9, p. 59. (Index Catalogue of L.S.G.O., S. 3, v.9, p.1113.)

In the nornal rabbit, adrenalin given subcutaneously has no effect on the pupil; if given intravenously in fairly large doses there may be a dilation lasting less than 1 minute. 1/50 cc. of adrenalin per kilo of animal was the minimum amount that could be relied upon to give a definite dilation; as the dosage of adrenalin was increased, the dilation also becomes greater, remained at its maximum for a longer time, and the return to a normal diameter was slower.

(Puckner, W.A. Sec'y. of Council on Pharmacy and Chemistry.) 1911

The Bio-Assay of Epinephrin Preparations.

Journ.Am. Med. Assoc., 57, p. 1149. (Am. Journ. Pharm., 83, p. 574.)

Shows the desirability of having a biological standard for products of epinephrine to be recognized by manufacturers so as to insure a fairly uniform product.

Ephraim, A. 1912

Ueber die Wirkung des Adrenalins beim Asthma Bronchiale und bei der Chronischen Bronchitis.

Deutsch. Med. Wochen., 38-II., p. 1453. (Wood & LaWall, Dispens.U.S.Am., 21 ed., p. 433.)

Recommends a solution of epinephrine to be applied directly to the bronchial mucous membrane in treatment of asthma.

Jackson, D.E. 1912

The Pulmonary Action of the Adrenal Glands.

Journ. Pharmacol. & Exper. Therap., 4, p. 59. (Index Catalogue of L.S.G.O., S.3, v.9, p. 1114.)

The results of experiments bear out the opinion that in the intact animal one of the functions of the adrenal glands is to assist by means of their internal secretion in counteracting pathological processes or products which tend to produce an abnormal broncho-constriction.

Meltzer, S.J. 1912

The Destruction of Adrenalin by Spinal Fluid.

Proc. Soc. Exp. Biol. Med., 9, p. 27. (Chem.Abstr., 6, p. 1033; Yrbk.Brit.Pharm.Conf., 49, p. 264.)

Neither blood nor serum is capable of destroying adrenal extract. Spinal fluid is capable, however, of destroying adrenine. This appears to be a physiological property. Spinal fluid from poliomyelitis seems to destroy adrenine definitely more readily than that from tuberculous meningitis.

Ritchie, P. 1912

Disappearance of a Skin Carcinoma under Local Application of Adrenin.

Lancet, 90, p. 1754. (Yrbk. Brit. Pharm. Conf., 50, p. 233.)

Adrenin was applied locally to a skin carinoma of the cheek to assist penetration of radium rays by rendering the part anemic. The ulcer finally healed; an improvement continued when the radiation was discontinued so that the change for the better was attributed to the adrenin.

Weidlein, E.R. 1912

(Epinephrine from the Whale.)

Journ.Am. Med. Assoc., 59, p. 2263. (Yrbk. Am. Pharm. Assoc., 1, p. 471; Journ. Indust. and Eng. Chem., 4, p. 636; Am. Journ. Pharm., 85, p. 129; Yrbk. Brit. Pharm. Conf., 50, p.2.)

Adrenal glands of the whale are about 500 times as large as those of cattle; the yield of active principle proportional in amount. As much as 1.2 Gm. of the active principle has been extracted from a single whale adrenal gland.

_____, _____. 1912

(Adrenalin.)

Oil, Paint and Drug Reporter, 81, May 6, p. 34. (Am. Journ. Pharm., 84, p. 269.)

"A news note reports that the United States Circuit Court of Appeals of the Second Circuit has substantially upheld the decision of the Circuit Court for the Southern District of New York in regard to the patents on the Suprarenal active principle, but does not include a ruling on the question covering chemical compounds having the same characteristic and reactions, produced wholly irrespective of the suprarenal glands, the court holding that the claims should be restricted to a substance in the production of which the suprarenal glands have played some part."

Aikman, J. 1913

(Extracts of the Suprarenal Glands; Its Therapeutical Uses.)

New York Med. Journ., 97, p. 649. (Index Catalogue of L.S.G.O., S.3, v.9, p. 1114.)

Discusses the history, physiology, physiological action, therapeutic action and toxic effects of the extract of the suprarenal glands.

Crawford, A.C. & Twombly, M.M. 1913

Notes on the Response of Veins to Epinephrine.

New York Med. Journ., 98, p. 327. (Index Catalogue L. S.G.O., S.3, v.9, p.1112.)

Found that isolated rings of different veins including the femoral, iliac and saphenous veins of dogs contracted in a solution containing epinephrin.

Folin,A., Cannon, W.B. & Denis, W. 1913

A New Colorimetric Method for the Determination of Epinephrine.

Journ. Biol. Chem., 13, p. 477. (Journ. Soc. Chem. & Ind., 32, p. 159; Am. Journ. Phys., 86, p. 353; Pharm. Journ. & Pharmacist, 90, p. 629; Yrbk. Am. Pharm. Assoc., 2, p. 273; Yrbk. Brit. Pharm. Conf., 50, p. 2.)

Discuss a new colorimetric test for the estimation of adrenalin. The reagent used is made up of sodium tungstate and 85% phosphoric acid. The color produced is deep blue.

Jona, J.L. 1913

Adrenalin in the Emergency Treatment of Non-Corrosive Poisoning by the Mouth.

Brit. Med. Journ., 1913, 1, p. 271. (Yrbk. Brit. Pharm. Conf., 50, p. 297.)

Found that the administration of adrenalin solution immediately after the ingestion of KCN, or other non-irritant poison, will arrest absorption for so long that it forms a most valuable means of gaining time for the use of appropriate antidotes.

Lankford, J.S. 1913

Adrenal Preparations in Snake Bite.

New York Med. Journ., 97, p. 1397. (Yrbk. Brit. Pharm. Conf., 51, p. 166.)

Cites the acse of a patient bitten by a rattlesnake; he was in a condition of profound prostration, with rapid and feeble heart action, pulse somewhat irregular, temperature 96°F., vomiting frequently, restless, and delirious. Adrenaline was used freely, and in a very short time the pulse came down and grew stronger, blood pressure rose, temperature came up to mormal and the vomiting ceased. The adrenaline seemed to have arrested the poisonous action of the venom.

Lusk, G. 1913

The Influence of Epinephrin on Carbohydrate Metabolism.

Proc. Soc. Exp. Biol. & Med., 11, p. 49. (Index Catalogue of L.S.G.O., S.3, v.9, p.1113.)

Found that adrenalin does not inhibit the pancreas causing diminished carbohydrate oxidation, nor does it stimulate the thyroid causing increased rpotein metabolism.

Swann, A.W. 1913

Urticaria Treated with Epinephrine.

Am. Journ. Med. Sciences,145, p. 373. (Yrbk.Brit. Pharm. Conf., 51, p. 167.)

Treated 6 cases of urticaria by subcuraneous injection of adrenaline chloride solution. The rapidity with which the eruption subsided was striking; the skin became normal in less than half an hour. Although the relief is only temporary, if properly regulated and repeated doses are used, a cure may be effected.

Will, E.B. & Crawford, A.C. 1913

Note on the Action of Epinephrin on the Quinea Pig Uterus.

Proc. Soc. Exp.Biol. & Med., 11, p. 126. (Index Catalogue L.S.G.O., S.3, v.9, p. 1114.)

The experiments done at several different times during the pregnancy indicated that epinephrin causes relaxation of the uterine horn and longitudinal strips of the guinea-pig uterus.

Beckwith, C.P. 1914

The Pharmacy of Adrenalin.

Journ.Am. Pharm.Assoc., 3, p. 1547. (Wood & LaWall, Dispens.U.S.Am., 21 ed., p. 432.)

Solutions of epinephrine will retain their activity for long periods of time if protected from heat, light, and air.

Cannon, W.B. & Gray, H. 1914

The Hastening or Retarding of Coagulation by Adrenalin Injections.

Am. Journ.Physiol., 34, p. 232. (Wood & LaWall, Dispens. U.S.Am., 21 ed., p. 433.)

Report the use of epinephrine in treatment of internal hemorrhages.

Donaldson, M. 1914

Some Observations on the Effects of Adrenalin.

Brit. Med. Journ.,1914, 1, p. 476. (Wood & LaWall, Dispens.U.S.Am., 21 ed., p. 433.)

The direct injection of epinephrine into the heart produces a marked rise in the blood pressure.

Elliot, T.R. 1914

Some Results of Excision of the Adrenal Glands.

Journ.Physiol., 49, p. 38. (Am. Journ. Physiol., 81, p. 86; Journ. Pharmacol. and Exp. Therap., 8, p. 525; Am. Journ. Physiol, 77, p. 100.)

Removal of 1 adrenal gland in a cat does not affect the animal's health, but subsequent removal of the remaining gland practically always causes death, but not as quickly as when the 2 glands are removed at the same time.

The percentage of epinephrine in the suprarenal glands of beef is higher than in those of either the hog or the sheep.

Selkirk, W.J.B. 1914

The Effects of Adrenalin.

Brit. Med. Journ., 1914, p. 816. (Index Catalogue of L.S.G.O., S. 3, v.9, p. 1111.)

Describes a number of cases in which the patient has benefited by the use of adrenalin.

Beckwith, C.P. 1915

Hints on Dispensing Adrenalin.

Bullet. of Pharm., p. 129. (Remington and Wood, Dispens. U.S.Am., 2o ed., p. 626.)

The incompatabilities of adrenalin solutions are discussed in detail and explained.

Hartman, F.A. 1915

The Differential Effects of Adrenin on Splanchnic and Peripheral Arteries.

Am. Journ. Physiol., 38, p. 438. (Index Catalogue of L.S.G.O., S. 3, v.9, p. 1112.)

Dilute adrenalin solutions caused dilation of the peripheral arteries, the same dose of adrenalin caused constriction of the splanchnic arteries.

Brown, E.D. 1916

Observations on the Effect of Epinephrine on the Medullary Centers.

Journ. Pharmacol. & Exper. Therap., 8, p. 195. (Index Catalogue of L.S.G.O.,S.3, v.9, p. 1110.)

Results tended to show that when epinephrine is perfused through the cerebral circulation, it may in a certain per cent of cases cause a slowing of the heart and that this slowing is at least in part due to a direct stimulation of the vagus center. There is certain evidence which strongly suggests the probability that the drug also stimulates the vasomotor center.

Fridericia, L.S. 1916

Contraindications Against Subcutaneous Injections of Epinephrin.

Journ.Am. Med. Assoc., 66, p. 466. (Wood & LaWall, Dispens.U.S.Am., 21 ed., p. 433.)

Caution should be used in treating asthma with epinephrine; if mistakenly diagnosed as bronchial asthma whn really of cardiac origin, death may occur.

Githens, T.S. & Meltzer, S.J. 1916

Influence of Pituitrin and of Adrenalin on the Pupil of Normal and Ganglionectomized Rabbits.

Proc.Soc.Exp.Biol.Med., 14, p. 53. (Chem. Abstr., 11, p.2234, Yrbk. Brit. Pharm. Conf., 55, p. 274.)

The intravenous injection of pituitrin produces a considerable constriction of the pupil, while adrenaline produces a moderate dilation of short duration. Pituitrin counteracts to a degree the dilating effect of adrenaline.

Grabfield, G.P. 1916

The Effect of Adrenin on the Factors of Coagulation.

Am. Journ. Physiol., 42, p. 46. (Wood & LaWall, Dispens. U.S.Am., 21 ed., p. 433.)

Found that intravenous injection of small doses of adrenin (0.143 cc. of a 1:100,000 solution per kilo) decreased the coagulation time by increasing the amount of prothrombin in the circulating blood.

Harrower, H.R. 1916

The Oral Administration of Adrenaline.

New York Med. Journ., 104, p. 893. (Index Catalogue L.S.G.O., S.3, v.9,p. 1115.)

Discusses several cases in which satisfactory results were obtained after oral administration, although the impression and opinion heretofore has been that adrenaline was not effective when given by mouth because it is reacted upon so quickly by the gastric juices.

Marshall, E.K. Jr. & Davis, D.M. 1916

The Influence of the Adrenals on the Kidneys (see below).

Journ. Pharmacol. and Exp. Therap.,8, p. 525. (Am. Journ. Phys., 81, p. 86.)

The urea concentration in the blood of adrenalectomized animals rises after complete removal of the adrenals to about twice the normal value and remains approximately stationery until shortly before death when it again rises. This suggests that the adrenals exercise some influence on the function of the kidneys. The above paper was presented in abstract before the Am. Soc. for Pharmacol. and Exp. Therap., Boston, Dec. 27, 1915; Journ. Pharmacol. and Exp. Therap., 8, p.111.

Berry, E.L. 1917

The Vasometer Effects of Adrenin when Administered without Anesthesia.

Endocrin., 1, p. 306. (Index Catalogue of L.S.C.O., S.3, v.9, p. 1112.)

One of the most striking results of the experiments was the marked depression effect of ether-anesthesia on the vasomoter reaction to adrenin. Almost without exception the duration of the effect of the adrenin was decreased from 10-30% by the ether. The return of the blood pressure to normal was much more gradual in most instances without anesthesia.

Hamilton, H.C. 1917

Biological Standardization.

Am. Journ.Pharm., 89, p. 61. (Yrbk. Brit. Pharm.Conf., 54, p. 271.)

Objects to theofficial methods of assaying Suprarenal gland because of 3 complications introduced into the test:-

1. The inaccurate manner of measuring the test dose.
2. The incomplete manner of measuring test dose.
3. The method of making a check assay.

Lucksch, F. 1917

"
Über den Adrenalingehalt der Nebennieren des Menschen bei rerscheidenen Todesursachen.

Virchow's Arch. path. u. Anat., 223, p. 290. (Chem. Abstr., 14, p. 1376; Yrbk. Brit. Pharm.Conf., 57, p. 39.)

The adrenalin content of healthy individuals in middle life is about 4 Mg./Gm. dry weight of Adrenal. Material obtained at autopsy uniformly contained less than this: among middle-aged persons 0.35 Mg./Gm., in newborn infants 0.13 Mg./Gm. Constitutional and infectious disease showed low values, with tumors almost as low. The lowest values, excepting in Addison's disease, were found in burns, the highest in nephritis.

Mann, F.C. & Mc Lachlin, L.C. 1917

The Action of Adrenalin in Inhibiting the Flow of Pancreatic Secretion.

Journ. Pharmacol. & Exp. Therap.,10, p. 251. (Journ. Amer. Med. Assoc., 69, p. 1739; Yrbk. Brit. Pharm. Conf., 55, p. 260.)

When epinephrine is administered a reduction of the amount of blood passing through the pancreas is noticed and there is always a decrease in the flow of pancreatic secretion. Thus the pancreatic vessels seem to be more sensitive toward the pressor action of epinephrine than any other region.

White, J.S. 1917

Physiological and Chemical Valuation of the Activity of Adrenalin Solutions.

Pharm. Journ., 98, p. 159. (Yrbk. Brit. Pharm. Conf., 54, p. 19; Wood & LaWall, Dispens. U.S.Am., 22 ed., p. 610.)

Discuss physical, chemical and color tests for purity and presence of adrenalin.

Auer, J. & Gates, F.L. 1918

The Administration of Epinephrin by Intraspinal Injections in Acute or Subchronic Cases Accompanied by a low Blood Pressure.

Journ.Am. Med. Assoc., 70, p. 70. (Index Catalogue of L.S.G.O., S.3, v.9., p. 1114.)

Discusses the value of intraspinal injection over intravenous injection of epinephrin in dangerous states of diseases.

Deniges, G. 1918

(Alkaloids andAdrenaline, Application of Gimbert and Lecteres Apomorphine Reaction to.)

Bull.d. Soc. Pharm., Bordeaux, 56, p. 185.(Journ. d. Pharm. et d. Chim., 229, p. 49; Yrbk. Brit. Pharm. Conf., 56, p. 2,)

(Adrenaline gives a red color when treated in the cold; if the mixture is heated above 50°C., the color may disappear if only a small quantity of adrenaline is present. The reaction is given by as little as 0.01 Mg. of adrenaline.)

The original was not available.

Gruber, C.M. 1918

Further Studies on the Effedt of Adrenalin upon the Blood Flow in Muscles.

Am. Journ.Physiol., 45, p. 302. (Index Catalogue L.S. G.O., S.3, v.9, p. 1112.)

Adrenalin in small doses produces active dilation of the vessels in cat's muscles when the nerves are intact. Adrenalin, any strength, produced no active vasodilation in muscles in which the nerves were recently cut.

Hartman, F.A. 1918

Adrenalin Vasodilator Mechanisms.

Endocrin., 2, p. 1. (Index Catalogue of L.S.G.O., S.3, v.9, p. 1112.)

Attempted to show that vasodilation is the usual response in certain areas of the body and that it may be due to stimulation of certain structures located neither in the central nervous system nor at the extreme periphery. Reports that both the dorsal root ganglia and the sympathetic ganglia contain vasodilator mechanisms which are susceptible to adrenalin.

Loew, O. 1918

Über die Natur der Giftwirkung des Suprarenins.

Biochem. Zeitg., 85, p. 295. (Journ. Chem.Soc., 114,I, p. 281; Yrbk. Brit. Pharm. Conf., 56, p. 229.)

When in the form of its salts in neutral solution, adrenalin has only a very slightly toxic action. The free base, however, and its first red oxidation product are extremely toxic, and this action can be readily demonstrated on the nucleus of Spirogyra.

Elphinstone, J.H. 1919

Novocaine - Adrenalin Stock Solution.

Dental Cosmos, 61, p. 675. (Chem.Abstr., 13, p. 1742; Yrbk. Am. Pharm.Assoc., 8, p. 525.)

The solution should be in a test-tube, kept in a glass cylinder, at the bottom of which is placed chloroform containing a trace of hydrochloric acid. The glass cylinder is fitted with a ground glass cover smeared with petrolatum.

Grimbert, ____. & Leclere,____. 1919

(Pyrocatechol and Adrenaline - Test for.)

Bull. d. Soc. pharm. Bordeaux, 57, p.____. (Rep. de Pharm., 30, p. 184; Pharm. Journ., 102, p. 426; Yrbk. Am. Pharm. Assoc., 8, p. 156.)

(If a solution of adrenaline is heated with sodium acetate and mercuric chloride, a deep red color results. The temperature must not exceed 70-80°C.)

The original was not available.

Gruber, C.M. 1919

The Significance of Epinephrin in Muscular Activity.

Endocrin., 3, p. 145. (Index Catalogue of L.S.G.O., S.3, v.9, p.1113.)

From experiments concluded that epinephrin exerts some specific action upon fatigued muscles other than that due to mere circulatory changes.

Patients with hypertension often showed severe reactions to 1 mg. or less of epinephrine. Marked responses were obtained in 68% of 22 cases. This epinephrine sensitiveness occured irrespective of the cause, the degree, or the duration of the hypertension. None of these patients showed evidences of significant endocrine disturbance.

Peabody, F.W., Sturgis, C.C., Tompkins, E.H. & Wearn, J.T. 1920

Epinephrine Hypersensitiveness and its Relation to Hyperthyroidism.

Med. Rec., 98, p. 284. (Index Catalogue of L.S.G.O., S.3, v.9, p. 1110.)

State that epinephrine hypersensitiveness, as indicated by the "positive" reaction after injections of epinephrin according to the method of Goetsch, had become so generally regarded as of specific diagnostic significance in hyperthyroidism that it had seemed to be of importance to study in detail the conditions under which it might occur. Found that after wide investigation that it should not be regarded as having any special significance in the diagnosis of hyperthyroidism.

Scoville, W.L. 1920

The Colorimetric Estimation of Adrenalin.

Journ.Ind.Eng.Chem., 12, p. 769. (Yrbk. Brit.Pharm. Conf., 58, p. 25.)

With oxidizing agents and with alkalies adrenalin produces colors, usually intense, which vary from an orange to a red or brown or from a violet to a red. Under definite conditions the intensity of the color is proportional to the amount of adrenalin present. Methods have therefore been recommended for the quantitative estimation of this base in suprarenal glands by color reactions.

(Editor) 1921

Nine Adrenalin Prescriptions.

Bull. Pharm., 35, p. 122. (Midland Drugg., 55, p. 140; Yrbk. Brit. Pharm.Conf., 59, p. 237.)

Deterioration of adrenalin solutions, usually due to oxidation, is retarded by acids, hastened by alkalis. A trace of strong acid is more efficient than an equivalent of a weak acid such as boric or benzoic. Avoid all iron salts, also the use of glass vessels yielding free alkali. When alkaline mixtures are prescribed in the form of a spray, direct adding the adrenalin solution immediately before use. Adrenalin is incompatable with iodine and with $HgCl_2$.

Grevel, W. 1921

Zur Intrakardialen Injektion.

Berlin. Klinisch.Wochen., 58, p. 1381. (Wood & LaWall, Dispens.U.S.Am., 21 ed., p. 433.)

The direct injection of epinephrine into the heart is recommended in very alarming conditions of surgical shock, collapse during anesthesia, and other forms of circulatory failure.

Garnier, M. & Bloch,S. 1921

(The Epinephrin Test.)

Bull.Soc.Med.Hopit.,Paris, 45, p. 1137. (Journ.Am. Med. Assoc., 77, p. 892; Wood & LaWall, Dispens.,U.S.Am., 21 ed., p. 1280.)

(Comments upon the Goetsch's Test for hyperthyroidism by using epinephrin. Its diagnostic value is questioned.)

The original was not available.

Hoskins, R.G. 1921

The Reaction to Epinephrin Administered by Rectum.

Journ.Pharmacol. & Exp.Therap., 18, p. 207. (Index Catalogue L.S.G.O.,S.3, v.9, p.1115.)

Epinephrin was administered to dogs and cats by rectum. Blood pressure and intestinal peristalsis were recorded. The drug, in doses of from 1-5 mgm., produced either no or relatively slight effects. In positive reactions peristalsis was depressed and blood pressure either augmented or depressed, the effect persisting from 3 minutes to 1 hour in various cases.

Houssay, B.A. & Lewis, J.T. 1921

Importances Comparatives des Parties Medullaire et Cortical des Surrenales.

Compt.-rend.Soc.Biol.de Paris, 85, p. 1210. (Wood & LaWall, Dispens.U.S.Am., 21 ed.,p.1411.)

In lower animals, death is caused by extirpation of suprarenal glands.

Meltzer, S.J. & Auer, J. 1921

On the Duration of Constriction of Blood - vessels by Epinephrin.

Journ.Pharmacol. & Exper. Therap., 17, p. 177. (Index Catalogue of L.S.G.O., S.3, v.9, p.1112.)

The experiments reported in this paper have shown conclusively that a subcutaneous injection of epinephrine in the ear of rabbits causes a constriction of all vessels of that ear. The constriction is quite intense; but the outstanding feature is its very considerable duration - between 3 to 8 hours.

Richard, F. & Malmy, M. 1921

Sur la preparation et la conservation des solutions d'adrenaline.

Journ.d. Pharm. et d. Chim., 182, p. 209. (Yrbk.Brit. Pharm.Conf., 58, p. 213.)

Adrenalin, 1 Gm., is dissolved in 100 cc. of 0.75% NaCl solution containing 1 Gm. of SO_2. The mixture is then diluted to 1,000 cc. with 0.75% NaCl solution which has been sterilized previously. This solution keeps well.

Tatum, A.L. 1921

Ephinephrine Hyperglycemia.I.

Journ.Pharmacol. and Exp.Therap., 17, p. 395. (Journ. Pharmacol. and Exp. Therap., 19, p. 215.)

"Conclusion:- From a study of all available evidences in the literature together with the data presented in this paper we are forced to conclude that epinephrine glycogenalysis cannot be satisfactorily explained on the basis of hepatic asphyxia or acidosis. The real mechanism of epinephrine mobilization of carbohydrates therefore is as yet undetermined."

Tiffeneau, M.M. 1921

Standardisation of Adrenalin.

Chem. & Drug., 94, p. 708. (Am. Journ. Pharm., 93, p. 515.)

Since so many adrenalin products of varying degrees of purity have been placed on the market, believes that they should be placed under a control system so that they may become standardized.

Breteau, P. 1922

Solution de novocaine-adrenaline pour anesthetesie locale.

Journ.d. Pharm. et d. Chim., 184, p. 97. (Yrbk. Brit. Pharm.Conf., 59, p. 227.)

Although novocaine solutions may undergo no evident chemical change by sterilizing, the diminution of their physiological activity is very considerable. To avoid this make up a solution using novocaine, adrenalin solution (1:1000), and a saturated benzoic acid solution. This preparation retains its anesthetic activity and only very small quantities need be used to obtain perfect anesthesia.

Debucquet, M.L. 1922

Solution d'adrenaline pour injections.

Journ.d. Pharm. et d. Chim., 184, p. 136. (Yrbk. Brit. Pharm.Conf., 59, p. 237; Yrbk. Am. Pharm.Assoc., 11, p. 72.)

A saturated aqueous solution of benzoic acid affords a convenient and effective vehicle for the preparation of adrenalin solutions which keep well.

Gruber, C.M. 1922

The Effect of Epinephrine on Excised Strips of Frogs' Digestive Tracts.

Journ.Pharmacol. & Exp. Therap., 20, p. 321. (Yrbk. Am. Pharm.Assoc., 11, p. 211.)

Most parts of thealimentary canal of the frog appear to be sensitive to adrenalin; they responded by contraction and relaxation to quite weak solutions.

Marine, D. & Baumann, E.J. 1922

Influence of Glands with Internal Secretions on the Respiratory Exchange. V. Further Observations on the Effect of Suprarenal Insu Hiciency (By Removal) in Thyroidectomized Rabbits.

Journ. Met. Res., 1, p. 777. (Am. Journ. Phys., 81, p. 86.)

The experiments furnished evidence that there exists a thyroid-suprarenal cortex relationship; the nature of this relationship is unknown, but the evidence suggests that the suprarenal cortex exercises a regulatory control over the thyroid activity.

Richaud, S. 1922

Sur les limites d'exactitude de la methode de controle physiologique des produits adrenaliniques.

Journ.d. Pharm. et d. Chim., 184, p. 154. (Yrbk. Brit. Pharm.Conf., 59, p. 210.)

There are limitations to the accuracy of the physiological method of testing adrenalin. It is exceptional that the same dose of a preparation injected several times into the same animal produces the same elevation of arterial pressure. The errors which may thus arise rarely reach as much as 50-60%, but oscillate between 20-30%. This type of test affords a valuable and rapid method for determining the quality of adrenalin products, and even to determine whether the substances tested are very active. It is not, however, to be taken as a precise qunatitative method, but merely to approximate the value of the substances tested.

Richaud, M.A. 1922

Remarques sur quelques points de technique dans la methode de controle physiologique des produits adrenaliniques.

Journ.de Pharm. et de Chim., 184, p. 289. (Yrbk. Am. Pharm.Assoc.,11, p. 207.)

Details of the technique of the physiological assay of adrenaline are given.

Richaud, M.A. 1922

Pouvoir hypertenseur compare de l'adrenalin racemique et de l'adrenaline gauche.

Journ. de Pharm. et de Chim., 185, p. 81.(Yrbk. Am. Pharm. Assoc., 11, p. 211.)

Racemic adrenaline may be substituted for the laevo form without loss of effectiveness; the difference in activity of the 2 forms is claimed to be negligible.

Richaud, A. 1922

Sur La Teneur en Adrnealine des Capsules Surrenales, Determinee par la Methode Chimique et par La Methode Physiologique.

Comptes rend. d. Soc. Biol., 86, p. 26. (Bull. d. Sci. Pharm., 29, p. 284; Yrbk. Brit. Pharm.Conf., 60, p. 26.)

The physiological method applied to the determination of adrenalin in powdered suprarenal capsules, invariable gives higher results than any of the chemical methods at present. This indicates either that there is present in the capsules some other constituent, besides adrenalin, which exerts a hypertensive action, or, as is more probalbe, that the methods at present used for the chemical extraction of adrenalin are faulty and fail to yield the whole of that active principle contained in the organ.

Sollman, T. & Brody, J.G. 1922

Influence of Ischemia on Infection.

Soc. for Exp. Biol. and Med.Proc., 19, p. 400. (Wood & LaWall, Dispens.U.S.Am., 21 ed., p. 432.)

Using a rabbit, the authors demonstarated results when epinephrin is used locally in wounds. The ears of the rabbit were cut, infected, and one of them treated with 1:1000 solution of epinephrin. The normal ear healed quickly, while the injected ear became inflamed and healed slowly.

Ulrich, H.L. & Rypins, H. 1922

A Note on Adrenalin Hyperglycemia in Man.

Journ. Pharmacol. and Exp. Therap., 19, p. 215. (Wood & LaWall, Dispens.U.S.Am., 21 ed., p. 433.)

The maximum intravenous dose of a 1:1000 solution of adrenalin to be injected into a normal man is approximately 0.33 cc.

Baumann, E.J. 1923

The Epinephrin Content of Commercial Suprarenal "Cortex" Preparations.

Endocrinology, 7, p. 81. (Index Catalogue of L.S.G.O., S.3, v.9, p. 1108.)

Discussed several preparations and emphasized the fact that the suprarenal cortex preparations obtainable on the market contain considerable amounts of epinephrine along with the glandular product.

Bodon, C. 1923

Intracardiac Injection of Adrenalin.

Lancet, 204, p. 586. (Index Catalogue L.S.G.O., S.3, v.9, p. 1114.)

Discussed cases of life-saving by an intracardiac injection of adrenalin, also describes the method of injection.

Stuber, B., Russmann, A. & Proebsting, E.A. 1923

Über eine chemische Methode des Adrenalinnachweises.

Zeitschr. ges. exp. Medizin, 32, p. 448. (Journ.Soc. Chem.Ind., 42, p. 739A; Yrbk. Brit.Pharm.Conf., 60, p.25.)

Different color reaction tests for the presence of adrenalin are discussed; some of the tests are capable of detecting adrenaline in dilutions up to 1 in 50-100 millions.

Van der Hoof, D. & Haskell, C.C. 1923

The Stability of Adrenalin Hydrochloride in Various Solutions.

Am. Journ.Med.Sci., 166, p. 119. (Chem.Abstr., 17, p. 3376; Yrbk.Brit.Pharm.Conf., 61, p. 374.)

Tested the ability of adrenalin to retain potency in various solutions:-

1. In borolyptol the pressor action almost entirely disappeared within 3½ hours.
2. In Dobell's Solution there was a definite loss in 24 hours after 1 week, the solution was inert.
3. In physiological saline solution little or no loss in 1 st. month, but solution was inert after 59 days.
4. In Listerine it maintained its potency for 19 days.
5. In antiseptic solution N.F. it retained its action for 4 months.

Bailly,O. 1924

Application de la reaction de Deniges-Grimbert-Leclere a la caracterisation et au dosage de l'adrenaline dans les poudres de surrenales.

Journ.d. Pharm. et d. Chim., 199, p. 404. (Pharm.Journ., 114, p. 660; Yrbk. Brit.Pharm.Conf., 62, p. 58.)

Discusses Deniges method for the colorimetric determination of adrenalin in the dry suprarenal: the reaction, a bright red color, is quite stable and can be determined against a standard solution.

Christian, H.A. 1924

Epinephrin and Suprarenal Gland in Internal Medicine.

Journ.Am.Med.Assoc., 83, p. 1588. (Index Catalogue L.S.G.O., S.3, v.9, p.1114.)

Discussed the direct action of epinephrin, that action on animals and patients that possess entirely normal suprarenal glands, in contrast to the replacement action of epinephrin and suprarenal gland in patients in whom there is believed to exist a deficiency of secretion from the suprarenal glands.

Faccaro, L. 1924

Adrenaline naturali e sintetiche.

Boll.chim.farm., 63, p. 4. (Yrbk.Am.Pharm.Assoc., 13, p. 40.)

In the Italina Pharmacopoeia adrenaline is defined as a substance which is found in the suprarenal capsules and which is also prepared synthetically. He contends that this definition is inaccurate because the 2 forms are different; the synthetic form is optically inactive.

Firma Wilhelm Kathe, Aktiengesellschaft. 1924

Adrecain.

Arch.d. Pharm., 262, p. 534. (Yrbk. Am.Pharm.Assoc., 13, p. 150.)

Adrecaine is a 2% novocaine-adrenaline solution marketed in ampule form.

Thompson, H.E.S. 1924

Idiosyncrasy to Adrenalin, with Reference to its Employment with Local Anaesthetics and in Goetsch's Test for Hyperthyroidism.

Lancet, 102,I, p. 743. (Yrbk.Brit.Pharm.Conf., 61, p.297.)

Some people show toxic effects, as a result of receiving a small dose of adrenalin, and these effects are increased if certain local anesthetics are given simultaneously. Toxic results from adrenalin might be eliminated in dental practice if dentists were to use a solution not stronger than 1 in 100,000. Advises the use of synthetic adrenalin rather than the natural product.

Wearn, J.T. 1924

Glandular therapy; pharmacology of epinephrin.

Journ.Am.Med.Assoc., 83, p. 1508. (Index Catalogue L.S.G.O., S.3, v.9, p.1115.)

Discusses the physiological reactions resulting when preparations of the suprarenal gland containing epinephrine are injected into man or animals.

Barlow, O.W. & Sollmann,I. 1925

Deceptive Effects of Extracts of Suprarenal Cortex: Cardiac Effect Produced by Potassium Content; Intestinal Effects due to the Epinephrin and Choline.

Am.Journ.Physiol., 72, p. 343. (Index Catalogue of L.S. G.O.,S.3, v.9, p.1112.)

Alcoholic extracts of the suprarenal cortex produce a striking hearblock when perfused throug frogs' hearts. This is not antagonized by atropine, and is due to the potassium extracted from the tissue.

Guyot, R. 1925

(Adrenalin, Color Reaction for.)

Bull.d.Soc.Pharm.Bordeaux, 63, p. 214.(Yrbk.Brit.Pharm. Conf., 63, p. 50.)

(A pink coloration results when adrenalin is treated with $NaNO_2$ and NaOH. As little as 0.00001 Gm. of Adrenalin may be detected by this reaction.)

The original was not available.

Stewart, G.N. & Roggott, J.M. 1925

Studies on Adrenal Insufficiency.

Proc.Soc.Exper.Biol.& Med., 22, p. 394. (Am.Journ.Phys., 77, p. 100; Ibid., 81, p. 86.)

Experiments were made on dogs with adrenals removed, using different intravenous injections and their actions carefully noted before death. Used water and sodium salts to prolong life.

Hartman, F.A. 1926

Experiments with Adrenal Insufficiency.

Proc.Soc.Exper.Biol.& Med., 23, p. 467.(Am.Journ.Phys., 81, p. 86; Ibid., 86, p. 353.)

Cats with adrenal glands removed were injected with different types of extracts of the adrenal gland and the hours they lived after these injections were recorded.

Jones, W.R. 1926

(Adrenalin for Bee-Stings.)

North-West Med., 25, p. 567.(Pharm.Journ., 118, p. 693; Yrbk.Brit.Pharm.Conf., 64, p. 266; Amer. Journ.Dis. Child., 33, p. 175.)

(Bee poison contains 2 toxins, a powerful local irritant and a general systemic poison. The former is supposed to be formic acid. The general poisoning symptoms are similar to anaphylaxis, and are accompanied by a sense of suffocation and bursting and by subcutaneous hemorrhages. Hypodermic injection of adrenalin hydrochloride corrects the general reaction and retards the local swelling, but does not alleviate pain.)

The original was not available.

Schneider, A. 1926

Dermographia : Dermographic Tests and Observations.

Journ.Am.Pharm.Assoc., 15, p. 810. (Am. Journ.Pharm., 98, p. 548.)

Dermographia alba indicated hypofunction and dermographia rubra shows hyperfunction of the adrenal gland. The tests are simple and should prove of value.

_____,____. 1926

(Adrenalin Solutions, Need of Caution in Dispensing.)

Pharm. Zeit., 71, p. 218. (Pharm.Journ., 117, p. 328; Yrbk.Brit.Pharm.Conf., 63, p. 263; Journ.d.Pharm. Belge, 8, p. 317.)

Could not locate the original article as given in the Pharm.Zeit.

(Care should be taken in dispensing adrenalin. The lethal dose varies with the method of administration. In experimenting, dogs will tolerate by oral administration doses a thousand times greated than those given intravenously. It has been recommended that a 1:1000 solution should not be injected but that a 1:10,000 dilution should be used.)

Baumann, E.J. & Kurlund, S. 1927

Changes in the Inorganic Constituents of Blood in Suprarenalectomized Cats and Rabbits.

Journ.Biol.Chem., 71, p. 281. (Am.Journ.Physiol., 81, p. 86.)

Found that there is a significant reduction in the blood sodium of suprarenalectomized cats.

Bourne, A. & Burn, J.H. 1927

The Dosage and Action of Pituitary Extract and of Ergot Alkaloids on the Uterus in Labor, with a Note on the Action of Adrenalin.

Journ.Obstet. & Yynnaecol., Brit.Empire, 34, p. 249.(Pharm. Journ., 119, p. 485; Quart. Journ. & Yrbk., 1, p. 142.)

Adrenaline by intravenous injection inhibits uterine contraction before delivery.

Marine, D. & Baumann, E.J. 1927

Duration of Life after Suprarenalectomy in Cats and Attempts to Prolong It by Injections of Solutions Containing Sodium Salts, Glucose and Glycerol.

Am.Journ.Phys., 81, p. 86. (Ibid., 86, p. 353.)

Concludes that diuresis is an important factor in determining the duration of life; when the loss of water by diuresis is compensated for by an addition intake, life is prolonged, and if not, life is shortened. Believes that results of suprarenal-ectomy thus far observed are details of a more fundamental and as yet unknown disturbance in nutrition in which the sympathetic nervous system is greatly concerned.

Martin,F. 1927

Sur L'insolubilite de l'adrenaline dans les huikes;

Journ.d. Pharm.et d. Chim., 246, p. 248.(Quart.Journ.& Yrbk., 1, p. 120; Yrbk. Brit.Pharm.Conf., 64,p. 304.)

Adrenalin is insoluble in vaselin and in olive and castor oils. Presents method for obtaining suspensions which are quite stable.

Mouriquand, G. & Leulier, A. 1927

Adrenaline des Surrenales et Cadaverisation.

Compt.Rend.Soc.Biol., 96, p. 1115.(Chem.Abstr., 21, p.2142; Am.Journ.Pharm., 99, p. 715.)

Adrenalin rapidly disappears from the suprarenal glands after death; it should be extracted immediatly after death if it is to be obtained satisfactorily.

Pilcher,J.D. 1927

Inactivation of Epinephrine by Certain Colloidal Silver Preparations.

Journ.Am.Med.Assoc., 88, p. 720.(Pharm.Journ., 119, p. 146; Yrbk.Brit.Pharm.Conf., 64, p. 309.)

Certain members of the organic silver sompounds protargol, argyrol and solargentum, in commonly used solutions, inactivate epinephrine with a few hours; therefore, if the local effect of epinephrine on the nasal mucous membrans is desired, it should not be used in combination with these substances or the mixtures should be freshly made. Neosilvol and silver nitrate solutions inactivate epinephrine more slowly.

Ehrismann,O. 1928

Zur Kritik der Theorie von der Indentität der Calcium - und Adrenalin wirkung.

Arch.f.Exp.Path.Pharm., 134, p. 247. (Quart.Journ. & Yrbk., 2, p. 476.)

By experiments on rabbits and cats, attempted to disprove the theory that calcium and adrenalin acted identically; he showed where their actions were similar but cannot be said to be identical.

Gelger, E. & Schmidt, E. 1928

Einfluss des Adrenalins auf die Zuckerneubildung.

Arch.f.Exp.Path.u.Pharm., 134, p. 173.(Quart.Journ. & Yrbk., 2, p. 471.)

Adrenaline does not regularly increase the proportion of sugar to nitrogen in the urine of phloridzinised dogs and it does not affect the fat content of their livers.

Goldzieher, M. 1928

Interrenin, Das Hormon der Nebennierenrinde.

Klin.Wochenschr., 7, p. 1124. (Pharm.Ztg., 73, p. 921; Quart. Journ. & Yrbk., 1, p. 440.)

Describes the method of obtaining the hormone from the cortex of the suprarenal glands.

Hartman, F.A., Brownell, K.A., Hartman, W.E., Dean, G.A. & Mac Arthur, C.G. 1928

The Hormone of the Adrenal Cortex.

Am.Journ.Phys., 86, p. 353. (Ibid., 95, p. 670.)

An extract of the cortex, free from epinephrine, was prepared; the name, cortin, was given to it.

Mednikianz, G.A. 1928

Über die durch Ergotamin und Adrenalin bewirkte Veränderung der Reststickstoffmenge in der aus den isolierten Organen abfliessenden Flüssigkeit.

Arch.f.Exp.Path. & Pharm., 136, p. 370. (Quart.Journ. & Yrbk., 2, p. 481.)

The residual nitrogen was estimated in the perfusion fluid from ox testicles obtained from the slaughter house, and from dogs' kidneys and rabbits' livers removed after death. Adrenalin increased and ergotamine decreased the amount of residula nitrogen in the perfusion fluid. After perfusing with ergotamine, adrenaline no longer increased the residual nitrogen. It is suggested that this is due to the action of these drugs on the sympathetic nerve endings of the organs.

Mendez, R. 1928

Antagonism of Adrenaline by Ergotamine.

Journ.Pharm. & Exp.Ther., 32, p. 451.(Quart. Journ. & Yrbk., 1, p. 470.)

Found that the effect of ergotamine in abolishing the augmentor actions of adrenaline is much more powerful than its effect in abolishing inhibitor actions.

Paget, M. & Loheac, P. 1928

Le dosage de l'adrenaline dans les capsules surrenales.

Journ.d. Pharm.et d. Chim., 248, p. 159.(Quart.Journ.& Yrbk., 1, p. 612.)

Describes a method for determining adrenalin in the suprarenal glands.

Szent-Gyorgyi, A. 1928

Observations on the Function of Peroxidase Systems and the Chemistry of the Adrenal Cortex.

Biochem.Journ., 22, p. 1387. (Quart. Journ., & Yrbk., 2,p. 94.)

It is shown that the adrenal cortex contains a relatively large quantity of a highly reducing substance which is specific for the interrenal system. The method of isolation of the substance is described and its chemical and physical properties are discussed. It is shown that the substance is a hitherto unknown, highly reactive isomer of glycuronic acid and that the substance is a hexuronic acid.

Verney, E.B. 1928

The Action of Drugs on the Kidney.

Quart.Journ. & Yrbk., 1, p. 546.

The action of adrenalin was included among the drugs studied and their action upon the kidney. States that adrenalin produces a diminished blood flow through the kidney, an increase in the volume of the kidney and an increased urinary flow.

Blatherwick, N.R. & Sahyun, M. 1929

The Influence of Epinephrine and Insulin upon the Distribution of Glycogen.

Journ.Biol.Chem., 81, p. 123. (Quart. Journ. & Yrbk., 2, p. 149.)

Injections of adrenalin cause rabbits to become more sensitive to insulin. This is not due to a depletion of the glycogen reserve in the liver as was previously thought, but the correct explanation of the phenomenon awaits solution.

Burn, J.H. & Ling, W.H. 1929

The Effect of Pituitary Extract and Adrenalin on Ketonuria and Liver Glycogen.

Quart.Journ. & Yrbk., 2, p.1.

Injections of adrenalin do not seriously affect the rise in liver glycogen, but they may reduce its amount below the normal on the second and third days of the fat diet. When they do, they coincidently increase the Ketonuria.

Koppanyi, T. 1929

Effect of Subcutaneously Injected Epinephrin in Normal Human Subjects.

Journ.Lab.Clin.Med., 14, p. 947. (Quart.Journ. & Yrbk., 2, p. 646.)

The fact is emphasized that adrenalin is usually rapidly absorbed but a certain amount is retained and forms a "depot" beneath the skin when injected subcutaneously.

Luckhardt, A.B. & Koppanyi, T. 1929

Adrenalin action Expedited by Massage.

Am.Journ.Pharm., 101, p. 727.

Adrenalin injected beneath the skin remains there fro a time; it is possible to produce blood pressure rises by massaging the areas which had been injected 24 hours previously.

Macht, D.I. 1929

Phytopharmacological Examination of Epinephrine and Ephedrine.

Journ.Am.Pharm.Assoc., 18, p. 335. (Quart.Journ.& Yrbk., 2, p. 342.)

Compared the action of the 2 alkaloids on plant growth. Since the action of ephedrine and adrenalin exert a very similar action on animals, the value of a test on plants is important since they show a pronounced difference when tested on plants.

Parade, G.W. & Voit, K. 1929

Zur Adrenalin - und Ephetonin behandlung der Adams-Stokesschen Krankheit.

Deut.Med.Woch., 55, p. 179. (Quart.Journ. & Yrbk., 3, p. 136.)

In a severe case of Stokes-Adams disease, onset of the attacks was prevented by administration of adrenalin or ephetonin while thyroxine, caffeine and digitalis all failed to alleviate the symptoms.

Rogoff, J.M. & Stewart, G.N. 1929

Suprarenal Cortical Extracts in Suprarenal Insufficiency (Addiston's Disease.)

The important part of the adrenal tissue is the cortex from which "interranalin" has been extracted; the medulla part of the gland is not indispensable.

Hartman, F.A., Brownell, K.A. & Hartman, W.E. 1930

A Further Study of the Hormone of the Adrenal cortex.

Am. Journ.Physiol., 95, p. 670. (Wood & LaWall, Dispens. U.S.Am., 22 ed., p. 1061.)

An extract of the adrenal cortex was prepared; it contains a hormone, cortin, which is essential to life.

Koppanyi, T. & Lieberson,A. 1930

Studies on the Duration of Action of Drugs: II - Mydriatic Actions of Epinephrine and Atropine.

Journ. Pharmacol. & Exp. Therap., 39, p. 187. (Quart. Journ. & Yrbk., 4, p. 153.)

Compares doses and length of time of action for the mydriatic action of epinephrine and atropine.

Munch, J.C. & Deckert, W.A. 1930

The Bioassay of Epinephrine - Procaine Mixtures.

Journ.Amer. Pharm.Assoc., 19, p. 354.(Quart. Journ. & Yrbk., 3, p. 680.)

By comparing the increases in blood pressure produced by a series of injections of procaine-epinephrine mixture with those produced by a previous series of injections of standard epinephrine it was possible to assay these mixtures by the method outlined in the U.S.P.X for epinephrine.

Paget, M. 1930

Nouvelle reaction coloree de l'adrenaline et de l'adrenalone.

Bull. d. Sci.Pharm., 37, p. 537. (Quart. Journ. & Yrbk., 4, p. 248.)

Gives various color reactions using ammonium molybdate with acid and alkaline solutions of adrenalin and adrenalone.

Azzolini, B. 1931

Nuova reazione cromatica dell'Adrenalina.

Boll. chim.farm., 70, p. 665. (Quart. Journ. & Yrbk., 4, p. 609.)

The reagent used is a mixture of 4 parts of solution of ammonia and 96 parts of alcohol (95-96%). A few drops of HCl is added to the adrenalin solution to be tested; the color at first is pinkish peach-colored and changes to a yellowish brown. The test is very sensitive.

Emery, F.E. & Griggith, F.R. 1931

The Influence of Adrenalin, Pituitrin, Histamine and Peptones on the Volume of the Liver.

Journ. Pharmacol. & Exp. Therap., 42, p. 233. (Quart. Journ. & Yrbk., 5, p. 125.)

Adrenalin in doses of 0.0005 to 0.001 mgm. injected into the hepatic artery or the portal or femoral vein of cats and rabbits produced a rise in blood-pressure and simultaneously a diminution in liver-volume. Pituitrin in larger doses produced similar affects.

Liverani, E. 1931

Studio comparativo sul potere Splenocontrattile dell'Adrenalina é dell'Efedrina.

Arch.Farm. sper., 52, p. 101. (Quart. Journ. & Yrbk., 4, p. 654.)

Ephedrine, injected intravenously in doses of 5 cgm., has a similar, but slightly inferior, action to 0.2 mgm. of adrenalin in producing contraction of the spleen in cases of splenomegaly.

MacKay, E.M. 1931

The Relation of Acquired Morphine Tolerance to the adrenal cortex.

Journ.Pharmacol. & Exp.Therap., 43, p. 51. (Quart. Journ. & Yrbk.,5, p. 124.)

The average weight of the adrenal glands in rats was increased 70% above normal by oral administration of morphine sulfate in doses gradually increased up to 100 mgm. per 100 sq.cm. body surface. The increase was mostly in the cortex.

Melville, K.I. & Stehle, R.I. 1931

The Antagonistic Action of Ephedrine (or Adrenaline) upon the Coronary Constriction Produced by Pituitary Extract and its Effect upon Blood Pressure.

Journ.Pharmacol. & Exp. Therap., 42, p. 455. (Quart. Journ. & Yrbk., 5, p. 134.)

Either ephedrine or adrenaline increase the pressor-effects of small doses of pituitary extract, but diminishes or abolishes the depressor effects of large doses.

Verda, D.J., Kneer, L. & Burge, W.E. 1931

The Effect of Ultra-Violet Radiation on the Pressor Action of Epinephrin.

Journ.Pharmacol. & Exp. Therap., 42, p. 383. (Quart. Journ. & Yrbk., 5, p. 135.)

Adrenalin chloride in a 1 in 15,000 aqueous solution, irradiated in an open dish 10 cm. from a quartz mercury vapor lamp, gradually lost its pressor activity. At the end of 35 minutes the latter had all disappeared, but the depressor action had become more pronounced.

Barker, J.H., Eastland, C.J. & Evers, N. 1932

The Colorimetric Determination of Adrenalin in Suprarenal Gland Extracts.

Biochem. Journ., 26, p. 2129. (Quart. Journ. & Yrbk., 6, p. 90.)

A large number of color reactions proposed for the estimation of adrenaline have been submitted to critical examination, with particular view to their suitability for the estimation of adrenaline in suprarenal gland extracts prepared fro the treatment of Addison's disease. Determined which tests were unreliable and which were quite satisfactory.

Benham, H.W., Fisher, M., More,I., & Thurgar, C.J.L. 1932

Three Cases of Addison's Disease Treated with an Extract of Suprarenal Cortex.

Lancet, 222, p. 125. (Quart. Journ. & Yrbk., 5, p. 137.)

Three fatal cases of Addison's disease are described. An aqueous, adrenalin-free extract of the suprarenal cortex was given intravenously in all 3 cases, resulting in definite improvement in 2, which however was not maintained after cessation of the treatment.

Glynn, H.E. & Linnell, W.H. 1932

Halogen Analogues of Adrenaline and Ephedrine Part I - 3.4 Dichlorphenyl and B-Aminoethanol.

Quart. Journ. & Yrbk., 5, p. 480.

The laevo isomers are so much more active than the dextro that the racemate may be considered to have about ½ the activity of the laevo. Pointed out the difference in the pharmacological activity of adrenaline and ephedrine:- adrenaline possesses a much greater pressor activity than ephedrine, but whereas ephedrine exerts this activity when administered orally, adrenaline does not.

Harris, L.J. & Ray, S.N. 1932

Vitamin C and the Suprarenal Cortex I. Antiscorbutic Activity of Ox Suprarenal.

Biochem.Journ., 26, p. 2067. (Quart. Journ. & Yrbk., 6, p. 102.)

Results of several experiments indicated that the suprarenal cortex is the richest known source of Vitamin C.

Harrop, G.A.Jr. & Weinstein,A. 1932

Addison's Disease treated with Suprarenal Cortical Hormone (Swingle-Pfiffner.)

Journ.Am.Med.Assoc., 98,II, p. 1525. (Wood & LaWall., Dispens. U.S.Am., 22 ed., p. 1061.)

Cortical extracts of the adrenal gland are recommended for the treatment of Addison's disease.

Hartman, F.A., Greene, C.W., Bowen,B.D. & Thorn, G.W. 1932

Further Experience with Cortin Therapy.

Journ.Am.Med.Assoc., 99, p. 1478. (Wood & LaWall, Dispens.U.S.Am., 22 ed., p. 1061.)

The use of cortin in the treatment of Addison's disease has not been as successful as has been expected. The insufficiency of cortin exists but it will take careful study to discover in what conditions it is really sufficient.

McCrie, J.G., Mears, I.M. & Millar, W.G. 1932

A Case of Addison's Disease Treated with Cortical Suprarenal Extract.

Brit.Med.Journ., 1932,II, p. 622. (Quart. Journ. & Yrbk., 6, p. 147.)

A case of Addison's disease is described which was treated with suprarenal cortical extract. From the clinical records, and the post-mortem pathological findings it is concluded that the results so far recorded cannot be regarded as more than encouraging; and that until the active principle of the suprarenal cortex has been identified, and its synthesis established on a commercial scale, treatment with cortical suprarenal extract must remain of limited value.

Oefelein, F. & Trautwein, H. 1932

Lebensdauer von nebennierenexstirpierten Meerschweinchen.

Arch.f. exp.Path.u.Pharmak., 165, p. 128. (Quart. Journ. & Yrbk., 5, p. 743.)

The operation of removing the suprarenals from guinea-pigs is described. The animals normally survive 7 to 8 days.

Rogoff, J.M. 1932

Addison's Disease - Further Report on Treatment with "Interrenalin" (Adrenal Cortical Extract).

Journ.Am.Med.Assoc., 99,II, p. 1309. (Wood & LaWall, Dispens.U.S.Am., 22 ed., p. 1061.)

An extract of the cortex of the gland was prepared; it was called interrenalin and its use has met with favorable results. "Addison's disease is the result of function of the adrenal cortex (interrenalin) and not of the medulla (epinephrine). Treatment with epinephrine, therefore, is bases on a concept that is not supported by substantial physiologic evidence. Further knowledge, leading to earlier recognition of the disease, is essential."

Rühl, A. 1932

Über, vergleichende experimentelle und Klinische Untersuchungen zur therapeutischen Wirksamkeit von verscheidenen Substanzen der Adrenalinreihe.

Arch.f.exp. Path.u.Pharmak., 164, p. 8. (Quart.Journ. & Yrbk., 5, p. 611.)

A number of drugs were tested on animal preparations damaged in various ways, and on patients, with the object of evaluating their therapeutic usefulness. Following conclusions found:-

1. Adrenaline is only effective in the treatment of collapse when given as a slow infusion.
2. Synthetic ephedrine is useful in the treatment of mild shock.
3. Adrenaline minus the meta-hydroxy group (Sympatol) is an effective heart stimulant.
4. Adrenaline plus ephedrine (Ephedraline) is effective in the treatment of severe shock.

Simpson, G.L. 1932

Addison's Disease and Its Treatment with Cortical Extract.

Brit.Med.Journ., 1932,II, p. 625. (Quart.Journ. & Yrbk., 6, p. 147.)

Describes 4 cases of Addison's disease successfully treated with suprarenal cortical extract and makes reference to 2 unsuccessful cases.

Zilva, S.S. 1932

The Antiscorbutic Activity of the Cortex of the Suprarenal Gland of the Ox.

Biochem.Journ., 26, p. 2182.(Quart.Journ. & Yrbk., 6, p. 102.)

Ox suprarenal cortex was tested for anti-scorbutic activity and found to contain more Vitamin C than the same weight of decitrated lemon juice tested simultaneously.

Brown, H.T. 1933

More Proposed New Formulae For the British Pharmaceutical Codex.

Am.Journ.Pharm., 105, p. 420.

Contains 2 formulas for adrenalin sprays:-
Nebula Adrnealinae Aromaticae and
Nebula Adrenalinae et Ephedrinae Oleosa.

Haddock, L.A. 1933

Changes in Acid Solutions of Adrenaline.

Am.Journ.Pharm., 105, p. 427.

Sterilization at 80°C. for 1 hour causes a slight destruction of adrenaline, but racemization is quite small.

Haddock.L.A. 1933

Changes in Acid Solutions of Adrenaline.

Quart. Journ. & Yrbk., 6, p. 496.

Showed that racemisation of laevo-adrenaline is comparatively rapid in HCl at approximately pH 0.1, but that at higher pH values of 1.4-3.7 it becomes negligibly small. The changes produced by light are also small from a quantitative standpoint, and consist mainly in slight oxidation, racemisation being negligible.

Harris, L.J. & Ray, S.N. 1933

Vitamin C. in the Suprarenal Medulla.

Biochem.Journ., 27, p. 2006. (Quart.Journ. & Yrbk., 7, p. 288.)

The Vitamin C in ox suprarenal gland is not limited to the cortex, which is found to contain 3 times the concentration of orange juice, but is present also in the medulla in a concentration 2 times that of orange juice.

Robbins, J.H. 1933

The Use of Cortin in a Case of Acute Hyposuprarenalism Occuring as a Sequela of Acute Streptococcic Sore Throat.

Journ.Am.Med.Assoc., 100,I., 657. (Wood & LaWall, Dispens. U.S.Am., 22 ed., p. 1061.)

Acute hyposuprarenalism which may occur more often than is believed is satisfactorily treated with cortin.

Simpson, S.L., Kohn-Speyer,A. & Korenchevsky,V. 1933

The Adrenal Cortex and Sex:- The Influence of Cortical Extract on Normal and Castrated Rats.

Lancet,225, p. 1194.(Quart.Journ. & Yrbk.,7, p. 148.)

It has not been possible to demonstrate any influence of a potent cortical adrenal extract on the sexual, endocrine, and some otherorgans of normal or castrated male rats. The difficulty of harmonising these results with the clinical evidence of the influence of adrenal tumour on primary and secondary sexual characteristics is emphasised.

Tuffi, R. 1933

Solutions d'adrenaline dans l'huile.

Scienze farm., 1, p. 36. (Chem Abstracts, 28, p. 3526; Chimie & industrie, 31, p. 624; Am. Journ.Pharm., 106, p. 269.)

A formula for preparing an oil solution of adrenaline is given. The base is treated with oleic acid, forming the oleate which is dissolved in excess oleic acid and in turn added to a vegetable or mineral oil.

Brunelli, B. 1934

Su di una Particolare Reazione Paradossa dell'Adrenalina.

Arch.Farmacol.sper., 57, p. 153. (Quart.Journ., & Yrbk., 7, p. 299.)

As is well known the intravenous injection of adrenaline produces an increase in the pressure in the pulmonary artery with a parallel diminution in the volume of theliver. If, however, histamine is injected before the adrenaline, thepressure in the pulmonary artery is reduced and the hepatic volume increased. The experiments were conducted on cats.

Hoff, H.E. & Nahum, L.H. 1934

The Role of Adrenaline in the Production of Ventricular Phythms and Their Suppression by Acetyl-b-Methylcholine Chloride.

Journ.Pharmacol.& Exp.Therap., 52, p. 235. (Quart.Journ. & Yrbk., 8, p. 149.)

When large doses of adrenaline are injected in to cats anesthetized with amytal, there is profound slowing of the heart with prolongation of the conduction time through the auricle. Ventricular extra systoles occur. These changes in the rhythm of theheart do not take place if the vagus is stimulated or if acetyl-choline is injected. Ventricular extra systoles are readily produced by adrenaline after chloroform and after administration of benzol.

Mendelson, R.W. 1934

Cortin in the Treatment of Progressive Muscular Dystrophy.

Journ.Am.Med.Assoc., 102, p. 604. (Wood & LaWall, Dispens.U.S.Am., 22 ed., p. 1061.)

A case of intractable condition of progressive muscular dystrophy was reported to have been benefited by the administration of cortin.

Mendez, R. 1934

The Standardisation of Extracts of the Suprarenal Cortex.

Quart.Journ. & Yrbk., 7, p. 641.

The mortality in adrenalectomized rats varies so largely that it is impossible to use the survival period observed after injections of cortical extract as a basis of standardization.

Barbour, O. 1935

Suprarenal Gland and Serotherapy in the Treatment of Whooping Cough.

Arch. Pediat., 52, p. 143. (Brit.Med.Journ., 1935, 1, p. 48C; Pharm.Abstr., 1, p. 352.)

Recommends the use of the whole suprarenal gland in the treatment of whooping cough, the best results are obtained when treatment is followed by treatment with commercial vaccines or non-specific proteins.

Ettinger, G.H. & Hall, G.E. 1935

Synergy of Adrenaline and Acetylcholine on the Pulmonary Blood-Vessels in the Rabbit.

Quart.Journ.Exptl.Physiol., 25, p. 259.(Squibb Abstract Bull., 8, p.A-1898; Pharm.Abstr., 2, p. 399.)

After repeared injections of acetylcholine the pulmonary blood vessels in the rabbit fail to respond but the sensitivity may be restored by epinephrine.

Hamet,R. 1935

Sur le Pouvoir Anesthesique Local de La Coryanthine et sur l'Inverion, par cet Alcalude, Des Effets Respiratoires de l'Adrenaline.

Compt.Rend.d.Soc.Biol., 118, p. 774. (Squibb Abstr. Bull., 8, p.A0651; Pharm.Abstr., 1, p. 184.)

Tested on a rabbit's cornea, cocaine has $\frac{1}{2}$ and corynanthine 1/8 the anesthetic activity of yohimbine. In chloralosed 10-11 Kg. dogs intravenously injected with epinephrine provoked slight polypnea instead of apnea. In one case, although the epinephrine was rendered slightly hypotensive by corynanthization, it produced a transient cessation of respiration before slight polypnea, indication of that the respiratory effects are not exclusively dependent on the modifications of the blood pressure.

Heard, R.D.H. & Welch, A.D. 1935

The Perfusion of the Adrenal Gland with Reference to the Mechanism of Adrenaline Stabilisation.

Biochem.Journ., 29, p. 998. (Pharm.Abstr., 2, p. 20.)

An investigation of the chemical and physiological properties of the Ringer-Locke perfusate of the adrenal has confirmed the secretion of a stable "sympathomimetic" substance.

Julien, L. 1935

Sur un Solute d'adrenaline au millieme de reaction sensiblement neutre et de bonne conservation.

Journ.d. Pharm. et d. Chim., 232, p. 53. (Pharm. Weekblad., 73, p. 519; Pharm.Abstr., 2, p. 394; Quart.Journ. & Yrbk., 8, p. 740.)

Discusses the pH of several different adrenalin solutions used in French Hospitals as compared with the one in the French Pharmacopoeia.

Linnell, W.H. 1935

Halogen Analogues of Adrenaline and Ephedrine.

Pharm.Journ., 135, p. 210. (Pharm.Abstr., 2, p. 61.)

The activities of the halogen analogues of the above compounds are discussed. Noted that solutions of dichloro-analague of adrenaline are more stable chemically than those od adrenaline itself - it may be boiled with water for considerable periods without suffering decomposition.

Loeb, R.F. 1935

The Adrenal Cortex.

Journ. Am.Med. Assoc., 104,II, p. 2177. (Wood & LaWall, Dispens.U.S.Am.,22 ed., p. 1062.)

Gives a brief history of the work on the adrenal gland, discussed the extracts prepared from the cortex,and the functions of the cortical hormone.

Nathanson,M.H. 1935

Action of Acetyl Beta Methycholin on Ventricular Phythms Induced by Adrenalin.

Proc.Soc.Exp.Biol.Med., 32, p. 1297. (Pharm.Abstracts,1, p. 183; Quart.Journ. & Yrbk., 8, p. 746.)

Acetylbeta methylcholine in man tends to counteract the effect of adrenaline on the rhythmic action of the ventricles.

Whitehorn, J.C. 1935

A Chemical Method for Estimating Epinephrine in Blood.

Journ.Biol.Chem., 108, p. 633. (Quart.Journ. & Yrbk., 8, p. 563;Quart.Journ.Pharm. & Pharmacol., 8, p. 563; Pharm. Abstr., 2, p. 194.)

A method is described for the determination of adrenaline in blood, depending upon the preferential adsorption of adrenaline from other basic and interfering substances by means of granular silicic acid, followed by extraction of the silicic acid with 2/3 N. sulfuric acid.

Youngken, H.W. 1935

The Microscopy of Powdered Desiccated Endocrine Glands.

Am.Journ.Pharm., 107, p. 463.

Gives a description, physical properties and histological characters of powdered desiccated suprarenal.

Cartland, G.F. & Kuizenga, M.H. 1936

Method of Extracting Adrenal Cortical Hormones and the Product of Such Method.

U.S.Pat., 2,053,549,Sept. 8, 1936. (Pharm.Abstr., 2,p.500.)

Mammalian adrenal glands are treated with a water-soluble solvent to extract the cortical hormone. The solution is concentrated to remove the solvent and leave an aqueous residue. The latter is extracted with petroleum ether to remove the fat, and is then extracted with ethylene dichloride and the ethylene dichloride extract is evaporated to remove the solvent.

Edkins, R.P. & Linnell,-W.H. 1936

Halogen Analogues of Adrenalin and Ephedrine:-Part II. Derivatives of Acetophenone.

Quart. Journ.Pharm.& Pharmacol., 9, p. 75. (Pharm. Abstr., 2, p. 344.)

The methods of preparation and properties of the following are given:-
3-chloro-4-hydroxy-w-amino acetophenone,
3-bromo- 4-hydroxy-w-amino acetophenone, and
others.

Edkins, R.P. & Linnell, W.H. 1936

Halogen Analogues of Adrenaline and Ephedrine:- Part III.Derivatives of Propiophenone and General Discussion.

Quart.Journ.Pharm. & Pharmacol., 9, p. 201. (Pharm. Abstr., 2, p. 541.)

Kharasch, M.S. 1936

Stabilized Epinephrine-Type Compound, and Process of Stabilizing it.

U.S.Pat. 2,047,144, July,7,1936.(Pharm.Abstr.,2, p. 509.)

Thiourea or a thiol or a sulfhydryl compound of like effect is used as a stabilizing agent. Numerous examples are given in the specifications.

Moodey, C.R. & Leake, C.D. 1936

The Quantitative Colorimetric Estimation of Epinephrine by Ammonium-o-iodoxybenzoate.

Journ.Pharmacol.& Exp.Therap., 57, p. 136.(Pharm.Abstr., 2, p. 374.)

Estimations may be made by adding to appropriately dilute solutions of epinephrine an equal volume of a 2% aqueous solution of ammonium-o-iodoxybenzoate, and, after allowing to stand for a half hour, comparing in a colorimeter with an epinephrine solution of known concentration.

Nielsen, N.A. 1936

Treatment of Asthmatic Attacks by Inhalation of Adrenaline.

Lancet, 231, p. 848. (Quart.Journ. & Yrbk., 10, p. 278.)

Discusses cases of asthma in which attacks have been treated with a solution of adrenalin. In every case there was quick and excellent effects from the treatment. The favorable result is considered to be due to a local effect of adrenalin.

Rae, J. 1936

Liq.Adrenalinae Hydrochloridi.

Pharm.Journ., 136, p. 447. (Pharm.Abstr., 2, p. 316.)

Different solutions were prepared and tested for the excess of acid.

Rees, H.G. 1936

The Adrenaline Content and Physiological Activity of Suprarenal Gland Extracts.

Quart.Journ. & Yrbk., 9, p. 659.

The Folin and persulfate methods for determination of adrenaline were examined and methods suggested whereby adrenaline may be determined colorimetrically in presence of ascorbic acid. Found that adrenaline content of glands as determined colorimetrically agrees with the value found by physiological assay.

Wilson, W.C., Rowley,G.D. & Gray, N.A. 1936

Acute Toxaemia of Burns:- Extract of Suprarenal Cortex in Treatment.

Lancet, 230, p. 1400. (Quart.Journ.& Yrbk.,10, p. 128.)

Describes 3 cases, 2 children and 1 adult, which suffered from extensice burns, about 25% of the body surface being affected, and which were saved by injections of Eucortone, an extract of suprarenal cortex.

Youngken, H.W. 1936

The Microscopy of Powdered, Desiccated Thyroid and Suprarenal.

Journ.Am.Pharm.Assoc., 25, p. 103. (Pharm.Abstr., 2, p. 221.)

Shows that biological assays are not enough to entirely satisfy the purity of the powdered drug. With microscopic descriptions available it can be determined whether or not the powdered gland is adulterated. Materials and methods are described in a general way and plates are

shown, naming the histological elements found.

Cionini, A. 1937

Therapeutic Uses of the Hormone of Suprarenal Cortex.

Omnia Med., 15, p. 1.(Quart.Journ. & Yrbk., 10, p. 294.)

(On normal subjects the injection of the cortex hormone produces sleepiness, sleep on the succeeding night is deeper and on waking the subject is more rested than usual. It increases the appetite and, if continued for several days, increases the capacity for work from 50-500%. In Addison's disease, results are somewhat uncertain, but in most cases, especially if given early it relieves many of the symptoms and prolongs life.

Green, D.E. & Richter,D. 1937

Adrenaline and Andrenochrome.

Biochem.Journ.,31, p. 596.(Quart.Journ.& Yrbk.,10, p. 568.)

Adrenalin induces a vigorous oxygen uptake when added in low concentration to the reconstructed lactic and malic dehydrogenase systems of heart muscle. This effect has been analysed and found to be due to the formation of a red-colored oxidation product, adrenochrome, which can act as a respiratory carrier. Describes the chemical and physical properties of adrenochrome.

Luduena, F.P. 1937

The Antagonism between Adrenaline and Some Isoquinoline Derivatives: Cotarnine and Anhydrocotarnine-n-methyloxindol.

Quart.Journ. & Yrbk., 10, p. 67.

Aspects of the physiological actions of anhydrocotarnine-N-methyloxindol chloride and of cotarnine chloride were investigated. The actions were compared with those of adrenaline.

UNITED STATES PHARMACOPOEIA (O-XI)

(1820-1930)

and

NATIONAL FORMULARY (I-VI)

(1886-1935)

HISTORY

of

SUPRARENALUM

U.S.P., - 1900, P. 223.

Glandulae Suprarenales Siccae

Desiccated Suprarenal Glands

The suprarenal glands of the sheep (Ovis aries Linne) or ox (Bos/ taurus Linne), freed from fat, and cleaned, dried, and powdered.

A light yellowish-brown, amorphous powder, having a slight, characteristic/ odor; partially soluble in water.

One part of Desiccated Suprarenal Glands, represents approximately 6 parts/ of fresh glands, free from fat.

Upon incineration it should not yield more than 7 per cent. of ash.

If 0.5 G, of Desiccated Suprarenal Glands be macerated with 25 cc. of water/ for fifteen minutes, and filtered, the filtrate should give an emerald-green color/ upon the addition of a few drops of ferric chloride T.S. The green color dis -/ appears quite rapidly.

U.S.P., - 1910, P. 424.

Suprarenalum Siccum

Dried Suprarenals

Suprarem.Sicc. - Glandulae Suprarenales Siccae U.S.P.VIII

Desicatted Suprarenal Glands

The suprarenal glands of animals which are used for food by man, / cleaned, dried, freed from fat, and powdered, and containing not less/ than 0.4 per cent. nor more than 0.6 per cent. of epinephrine, the active/ principle of the suprarenal gland. One part of Dried Suprarenals repre-/sents approximately 6 parts of fresh glands, free from fat. If assayed/ biologically one gramme of Dried Suprarenals contains the equivalent/ of ten milligrammes of laevo-methylamino-ethanol-catechol.

A light, yellowish-brown, amorphous powder having a slight, characteristic / odor; partially soluble in water.

Dried Suprarenals contain not more than 7 per cent. of moisture, and the/ yield of ash does not exceed 7 per cent.

Assay - Add 0.005 Gm. of finely powdered manganese dioxide and 10 mils of / distilled water to 0.01 Gm. of Dried Suprarenals; thoroughly shake the mixture / several times during one hour and filter. Compare the color of the filtrate in / a test tube or in any convenient manner, with the color of cobaltous chloride / T.S. and diluted gold chloride T.S. and (see Reagnets, Part II) combined as follows:/ Mix 1.85 mils of cobaltous chloride T.S. with 0.95 mil of diluted gold chloride / T.S. and 7.2 mils of distilled water; the color corresponds to 0.2 percent. of/ epinephrine in the filtrate obtained

above 2.95 of cobaltous chloride T.S./ with 1.25 mils of diluted gold chloride T.S. and 5.8 mils of distilled water corre-/sponds in color to 0.4 per cent. of epineph-rine; 4.05 mils of cobaltous chloride/T.S. with 1.35 mils of diluted gold chloride T.S. and 4.6 mils of distilled water/ corresponds in color to 0.6 per cent. of epinephrine; 5.15 mils of cobaltous/ chloride T.S. with 1.55 mils of diluted gold chloride T.S. and 3.3 mils of distilled/ water corresponds in color to 0.8 per cent. of epinephrine.

The percentages of epinephrine indicated by the above color standards are/ based upon the maceration of 0.01 Gm. of the Dried Suprarenals in 10 mils of/ distilled water as directed above, and filtering. In samples containing more/ than 0.8 per cent. of epineph-rine, 0.005 Gm. of the Dried Suprarenals may be/ taken, in which case the percentage stated above, as indicated by the color/ standards, should be doubled. The standard color solutions keep unchanged,/ if sealed in glass tubes.

For a method of assaying Dried Suprarenals see Biological Assays (Part II) - p. 608-609.

Average dose - Metric, 0.25 Gm. -Apothecaries, 4 grains.

U.S.P.,-1920, P. 132.

Epinephrina

Epinephrine

Epineph. Laevo-Methylaminoethanol catechol

$C_9H_{13}O_3N$

Description and Physical Properties - A white or light brownish, microcrystalline,/ odorless powder, gradually darkening on exposure to the air.

Epinephrine is very slightly soluble in water and in alcohol. It is insoluble/ in ether, chloroform, acetone, and in fixed or volatile oils.

Tests for identity and purity - Epinephrine combines with acids, forming salts/ which are readily soluble in water, and from these solutions the base may be/ precipitated by ammonia or alkali carbonates.

The acid solution is not effected by solutions of trinitrophenol, tannic/ acid, phosphomolybdic acid, mercuric potassium iodide, or platinic chloride.

A saturated aqueous solution of Epinephrine is slightly alkaline to litmus/ paper.

A slightly acid, aqueous solution of Epinephrine (1 in 1,000) gives with/ ferric chloride T.S. an emerald-green color, turning cherry-red and finally/ to brown on standing. Other oxidizing agents produce red, pink, or violet/ colors which change to brown. Fixed alkali hydroxides cause the solution to/ darken on standing, but do not precipitate the Epinephrine.

The ash from 0.1 Gm. is negligible.

Preserve in well-closed containers, protected from light.

Average Dose:- Hypodermic, Metric, 0.0005 Gm. - Apothe-/caries, 1/120 grain.

U.S.P.,-1920 , P. 211.

Liquor Epinephrinae Hydrochloridi

Solution of Epinephrine Hydrochloride

Liq. Epineph. Hydrochlor.

Solution of Epinephrine Hydrochloride is a solution of epinephrine in/ water and hydrochloric acid, containing in each 100 cc. not less than/ 0.095 Gm. and not more than 0.105 Gm. of $C_9H_{13}O_3N$.

Solution of Epinephrine Hydrochloride, diluted with physiological/ solution of sodium chloride in the proportion of one part of the Solu-/tion of Epinephrine Hydrochloride to 99 parts of the salt solution, and/ injected intravenously into dogs by the method described below, pro-/duces a rise in the systolic blood-pressure of the dog corresponding to/ that produced by an equal amount of the standard solution of epine-/phrine hydrochloride prepared as directed below.

Description and physical properties - A nearly colorless, slightly acid liquid, grad-/ually turning dark on exposure to air and light. When the solution has become/ brown in color or contains a precipitate, it must be rejected.

Tests for identity - The addition of 1 drop of ferric chloride T.S. in 10cc. of the/ solution produces an emerald-green color which soon turns to a cherry-red. and finally to brown. Other oxidizing agents produce red to pink or violet/ colors which change on standing. Fixed alkali hydroxides darken, it but do/ not precipitate the epinephrine.

Assay - Prepare a standard solution of epinephrine hydrochloride from the standard/ epinephrine by dissolving 0.050 Gm. of epinephrine in 5 cc. of tenth-normal/ hydrochloric acid, and dilute this to 50 cc. by the addition of distilled water,/ thus making a 1 in 1,000 solution. For the assay, add 1 cc. of this 1 in 1,000/ solution to 99 cc. of physiological solution of sodium chloride. This dilute solu-/tion (1 in 100,000) must be freshly prepared when needed. On account of the/ possibility of deterioration, the 1 in 1000 solution must have been recently/ prepared. It will keep for a short time if preserved in amber-colored bottles/ in a refrigerator, but it must be discarded if any signs of deterioration, such as/ discoloration, are observed.

Add 1 cc. of the Solution of Epinephrine Hydrochloride to be tested to / 99 cc. of physiological solution of Sodium chloride and thoroughly mix.

For the purpose of the assay, the dog to be used should be of medium size and/ be anesthetized with a suitable anesthetic. It is prepared for blood-pressure esti-/mations by inserting a cannula into the carotid artery and connecting the same/ with a mercury manometer. The trachea may also be exposed and a cannula/ inserted so that the animal may receive artificial respiration during the course/ of the experiment if necessary. The injections are made into the exposed/ femoral vein. Before the test is made, in case any muscular movement such as/ twitching is present, the dog should receive by intravenous injection a suffi-/cient dose of curare (page 475), but if the animal is deeply anesthetized this/ is not necessary. The dog should also receive a sufficient dose of atropine/ sulfate (from 0.001 Gm. to 0.002 Gm.) to paralyze the vagi, this paralysis/ being proved by electrical stimulation. The blood pressure tracing is recorded/ on a Kymograph. Injections must be made at regular intervals of approxi-/mately five minutes. Determine the amount of standard solution necessary to/ cause a rise in blood-pressure of from 30 to 60 mm. by injection intravenously/ varying doses of the solution and after a satisfactory dose has been ascer-/tained, the uniformity of reaction should be tested by the injection of two or/

more doses of equal size. If these injections produce approximately equal/ increases in blood-pressure, alternate injections of the solution to be tested and/ of the standard are made, varying the amount of the unknown until two or/ more successive injections raise the blood pressure to the same height, indica-/ting that the amount of active agent is the same in the doses used. From the/ results thsu obtained, the strength of the unknown solution may be determined/ and adjusted.

Preserve in small, well-filled, amber-colored bottles.

Average Dose - Hypodermic, Metric,0.5 cc. - Apothecaries,/ 8 minims.

U.S.P., - 1930, P. 207.

Liquor Epinephrinae Hydrochloridi

Solution of Epinephrine Hydrochloride

Liq.Epineph.Hydrochlor.

Solution of Epinephrine Hydrochloride is a solution of epinephrine/ in distilled water and hydrochloric acid, containing, in each 100 cc.,/ not less than 0.095 Gm. and not more than 0.105 Gm. of $C_9H_{13}O_3N$.

Solution of Epinephrine Hydrochloride, diluted with physiological/ solution of sodium chloride in the proportion of one part of the Solution/ of Epinephrine

Hydrochloride to 99 parts of the salt solution, and/ injected intravenously into a dog by the method described below, pro-/ duces a rise in the systolic blood-pressure of the dog corresponding to/ that produced by an equal amount of the standard solution of epineph-/rine hydrochloride prepared as directed below.

Description and physical properties - A nearly colorless, slightly acid liquid,/ gradually turning dark on exposure to air and light. When the solution has/ become brown in color, or contains a precipitate, it must be rejected.

Tests for identity - The addition of 1 drop of ferric chloride T.S. to 10cc. of / Solution of Epinephrine Hydrochloride produces an emerald-green color/ which soon changes to cherry-red and finally to brown.

Assay - Prepare a standard solution of epinephrine hydrochloride from the stand-/ ard epinephrine by dissolving 0.050 Gm. of epinephrine in 5 cc. of tenth-/ normal hydrochloric acid, and dilute this to 50 cc. by the addition of distilled/ water, thus making a 1 in 1000 solution. For the assay, add 1 cc. of this/ 1 in 1000 solution to 99 cc. of physiological solution of sodium chloride. This/ dilute solution (1 in 100,000) must be freshly prepared when needed. On/ account of the possibility of deterioration, the 1 in 1000 solution must have/ been recently prepared. It will keep for a

short time if preserved in hard/ glass containers in a refrigerator, but it must be discarded if any signs of/ deterioration, such as discoloration, are observed.

Add 1 cc. of the Solution of Epinephrine Hydrochloride to be tested to/ 99 cc. of physiological solution of sodium chloride, and thoroughly mix.

For the purpose of the assay, the dog to be used should be of medium size/ and be anesthetized with a suitable anesthetic. It is prepared for blood-/ pressure estimations by inserting a cannula into the carotid artery and con-/necting the same with a mercury monometer. The trachea may also be/ exposed and a cannula inserted so that the animal may receive artificial/ respiration during the course of the experiment if necessary. The injections/ are made into the exposed femoral vein. Before the test is made, in case/ any muscular movement such as twitching is present, the dog should receive/ by intravenous injection a sufficient dose of curare (page 506), but if the / animal is deeply anesthetized, this is not necessary. The dog should also/ receive a sufficient dose of atropine sulfate (from 0.001 Gm. to 0.002 Gm.)/ to paralyze the vagi, this paralysis being proved by electrical stimulation./ The blood-pressure tracing is recorded on a Kymograph. Injections must be/ made at regular intervals of approximately five minutes. Determine the/ amount of

of standard solution necessary to cause a rise in blood-pressure of/ from 30 to 60 mm. by injecting intravenously varying doses of the solution/ and after a satisfactory dose has been ascertained, the uniformity of reaction/ should be tested by the injection of two or more dose of equal size. If these/ injections produce approximately equal increases in blood-pressure, alternate/ injections of the solution to be tested and of the standard are made, varying/ the amount of the unknown until two or more successive injections raise the/ blood-pressure to the same height indicating that the amount of active agent/ is the same in the doses used. From the results thus obtained, the strength/ of the unknown solution may be determined and adjusted.

Note - A suitable preservative may be added to this solution (see Pres-/ervation of Solutions for Parenteral Use, page 7).

Storage - Preserve Solution of Epinephrine Hydrochloride in small, well-filled,/ amber-colored bottles or in ampuls.

Average Dose - By parenteral injection, Metric, 0.5 cc. -/Apothecaries, 8 minims.

N.F., 1936,P.345.

Suprarenalum

Suprarenal

Supraren. Desiccated Suprarenal

Dried Adrenal Substance Suprarenalum Siccum

Suprarenal Gland

Note: Suprarenal is to be dispensed when "Suprarenal Extract" or/ "Adrenal Extract" is called for, unless it is evident that a sterile solution/ of the active principles of Suprarenal is intended.

Suprarenal is derived from sound, clean and entire glands that are/ freed from external connective tissue and external fat. It yields not/ less than 0.8 per cent. of natural epinephrine of glandular origin, not/ more than 6 per cent. of moisture, and not more than 7 per cent. of total/ ash. One part of Suprarenal represents approximately 6 parts by/ weight of the fresh glands. It is free from diluents or preservatives./ If Suprarenal is dried by heat, it shall be dried in vacuum, and the tem-/perature of the drying material shall not exceed 60°C.

Description and physical properties - A light yellow to brown amorphous powder having a slight characteristic odor.

No disagreeable odor suggestive of putrefaction is present.

Suprarenal is only partially soluble in water.

Histological characters: Numerous chromophile (chromaffin) cells, both isolated/ and in loose aggregates, the individual cells stellate to irregular, with spheroidal/ to oval nuclei and granular cytoplasm which take a brownish coloration with/ chromic acid T.S.: numerous clear, jointed segments of non-medullated nerve/ fibers, the axons of which are colored mauve with eosin and hematoxylin T.S.,/ numerous cortical cells both isolated an in masses, the individual cells, cuboidal/ to irregularly rounded with spheroidal nuclei, some of the cells containing tiny/ fat globules, granules or pigments, the chromanti of the nucleus and granules/ staining blue, and the protoplasm red to purple with Delafield's hematoxylin/ T.S. and alcoholic eosin; numerous fragments of connective tissue fibers, fibro-/ cytes and intercellular substances, the fibers wavy, the fibrocytes slender, linear to/ fusiform, and all colored blue with a mixture of Mallory's stain and phospho-/tungstic acid T.S.; numerous minute granules of crystalline appearance and/ irregular form, and many isolated nuclei, few elastic fibers.

Assay - Triturate thoroughly 0.5 Gm. of the sample with 3 cc. of tenth-normal hydro-/chloric acid in a smooth glass or agate mortar, until a frothy, impalpable,

homo-/geneous fluid results. Wash this material quantitatively into a suitable graduated/ container with more tenth-normal hydrochloric acid, making up to a volume of/ 50 cc. Allow this mixture to macerate for three hours, with frequent agitation./ The material should be protected from light at all times. Filter through a dry/ filter, and proceed with the assay of this filtrate as directed under Liquor Epi-/nephrinae Hydrochloridi, U.S. Pharmacopoeia XI, page 207.

Prepare the solution for injection by diluting a portion of the filtrate (1 in 5/ or 1 in 10) with normal saline solution, the concentration to employ depending/ upon the potency of the sample as indicated by the preliminary injections.

Storage - Keep Suprarenal in well-closed containers, protected from moisture and light.

Average Dose: Metric, 0.25 Gm.- Apothecaries, 4 grains.

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