

## Bibliography of Metals in Foods and Biological Materials

(Supplementing the series published in the ANALYST, 1933, 58, 340, and bringing the Bibliography up to date)

### VI. BISMUTH

- ANIGSTEIN. Biologic and Chemotherapeutic Properties of Bismuth Butylthioaurate. *Ann. Maladies Vénériennes*, 1937, **32**, 544; Abst., *C.A.*, 1938, **32**, 3024.
- ARETZ. Death following Treatment with Bismuth. *Dtsch. med. Wschr.*, 1938, **85**, 1028; Abst., *B.C.A.*, 1938, 945AIII.
- ARIMA. Tissue Action of Bismuth. *Nagasaki. Igk. Z.*, 1936, **14**, 636; Abst., *C.A.*, 1938, **32**, 656.
- BRITTINGHAM. Bismuth Poisoning in the Treatment of Syphilis. *J. Med. Assoc. Georgia*, 1933, **22**, 323; Abst., *C.A.*, 1935, **29**, 1487.
- BENOTTI and THURMON. Photometric Determination of Bismuth in Urine. *J. Investigative Dermatol.*, 1941, **4**, 1; Abst., *C.A.*, 1941, **35**, 4789. (Bi determined by measurement of colour produced on addition of 0.4 N KI.)
- BERBERICH. Bismuth Treatment of Angina. *Klin. Wochschr.*, 1937, **16**, 122; Abst., *C.A.*, 1937, **31**, 3569.
- BERBERICH. Treatment of Tonsillitis with Bismuth. *Practica otolaryng.*, 1938, **1**, 33; Abst., *B.C.A.*, 1939, 189AIII.

- BORISOV-POTOTSKIĬ. Determination of Bismuth in Excreta and Tissues. *Vestnik. Venerol. i Dermatol.*, 1938, No. 3, 53; Abst., *C.A.*, 1940, **34**, 6187.
- BROWN, LUCIA and MILLS. Effects of Bismuth Sodium Tartrate on the Blood and Haematopoietic Organs. *J. Pharm. Exp. Ther.*, 1938, **63**, 292; Abst., *B.C.A.*, 1938, 838AIII.
- CASTEL. Histochemical Detection of Bismuth. *Bull. histol. appl. physiol. path. tech. Microscop.*, 1936, **13**, 290; Abst., *C.A.*, 1937, **31**, 2245. (Bi detected in tissues by formol fixation followed by staining with 1% brucine + 2% KI aq. soln.)
- CASTEL, LAMARQUE and TURCHINI. Historadiography and Histological Localisation of Medicinal or Toxic Substances of High Atomic Weight. *Compt. rend. Soc. Biol.*, 1936, **123**, 1051; Abst., *C.A.*, 1937, **31**, 1835. (Location of deposits of Bi, Au, Sb or As in cells of tissue sections by photography with soft X-rays.)
- CHOLAK. Spectrographic Analysis of Biological Material, II. Bismuth. *Ind. Eng. Chem., Anal. Ed.*, 1937, **9**, 26; Abst., *B.C.A.*, 1937, 108AIII. (0.00004 mg Bi detected, 0.001-3.0 mg determined with aver. error of  $\pm 10\%$ .)
- CLARKE and MARSH. Rate of Bismuth Absorption in Experimental Animals after Oral Administration. *J. Pharm. Exp. Ther.*, 1936, **57**, 399; Abst., *B.C.A.*, 1936, 1412A. (Highest concentration of Bi in liver and spleen occurs after 24 hrs; in kidney between 12 and 24 hrs.)
- COFFEY. Changes in the Growing Skeleton after Administration of Bismuth. *Amer. J. Dis. Child.*, 1937, **53**, 56; Abst., *C.A.*, 1937, **31**, 5874.
- CORDARO. Excretion of Bismuth in the Milk. *Riv. ital. ginec.*, 1935, **18**, 19; Abst., *C.A.*, 1937, **31**, 8026. (Goats, injected intramuscularly with water-soluble Bi preparations, secreted Bi in milk.)
- DUJARRIC DE LA RIVIERE, KOSSOVITCH and KATZ. Bordet-Wassermann Reaction of Serums Treated with Certain Salts. *Compt. rend. Soc. Biol.*, 1934, **116**, 373; Abst., *C.A.*, 1934, **28**, 5874. (Hg, As and Bi compounds compared.)
- EAGLE. Effect of Sulphydryl Compounds on the Anti-spirochaetal Action of Arsenic, Bismuth and Mercury Compounds *in Vitro*. *J. Pharm. Exp. Ther.*, 1938, **66**, 436; Abst., *B.C.A.*, 1938, 934AIII. (Anti-spirochaetal action inhibited.)
- EAGLE. Minimal Effective Concentration of Arsenic and Bismuth Compounds *in Vitro* on *Treponema Pallidum* in relation to Therapeutic Dose. *Amer. J. Syphilis*, 1939, **23**, 310; Abst., *C.A.*, 1939, **33**, 5489.
- EAGLE. Spirochaeticidal Action *in Vitro* of Bismuth Compounds on Pathogenic *Spirochaeta Pallida*. *Bull. Johns, Hopkins Hosp.*, 1938, **63**, 305; Abst., *C.A.*, 1939, **33**, 8294.
- EAGLE and DOAK. Observations on the Anti-spirochaetal Action *in Vitro* of Arsphenamines, Phenylarsenoxides, Bismuth and Mercury Compounds. *Rept. Proc. 3rd Intern. Congr. Microbiol.*, 1939, 637; Abst., *C.A.*, 1941, **35**, 2208. (Theory of action of these compounds.)
- EITZEN. Toxic Effects of Bismuth with especial Reference to Renal Damage and Report of a Case of Anuria. *Amer. J. Syphilis*, 1937, **21**, 674; Abst., *C.A.*, 1938, **32**, 989.
- ESSER. Clinical, Anatomical and Spectrographic Investigations of the Central Nervous System in Acute Metal Poisoning with particular Consideration of their Importance for Forensic Medicine and Industrial Pathology. *Deut. Z. ges. gericht. Med.*, 1936, **26**, 430; Abst., *C.A.*, 1936, **30**, 5653. (A review; Cu, Ag, Au, Sn, Pb, Bi, Cr, U, Mn, Fe, Ni, Co, Pt, Os mentioned.)
- FABRE and OKAC. Toxicity of Bismuth. *J. Pharm. Chim.*, 1937 (viii), **26**, 433; Abst., *B.C.A.*, 1938, 64AIII.
- FARMER, ABT and ARON. Influence of Arsenicals, Bismuth and Iron on the Plasma Ascorbic Acid Level. *Proc. Soc. Exptl. Biol. Med.*, 1940, **44**, 495; Abst., *C.A.*, 1940, **34**, 6361. (Bi compounds without influence.)
- FUJITA. Effect of Bismuth on Nitrogen Metabolism. *Sei-i-kai Med. J.*, 1936, **55**, No. 5, 1042 (English Abst. 3-4); Abst., *C.A.*, 1936, **30**, 8399.
- FUJITA. Effect of Bismuth on the Blood Corpuscles. *Sei-i-kai Med. J.*, 1936, **55**, No. 7, 1452; Abst., *C.A.*, 1937, **31**, 1885.
- GONZALEZ-CARRERO. Determination of Bismuth in Medicinal Substances. *Bull. Biol. Pharm.*, 1935, 181; Abst., *ANALYST*, 1935, **60**, 626.
- HALL and POWELL. Micro-Determination of Bismuth in Animal Tissues. *Quart. J. Pharm.*, 1933, **6**, 628; Abst., *B.C.A.*, 1934, 326A.
- HAMENCE. Scheme for Separation and Determination of Metallic Impurities in Foodstuffs. *ANALYST*, 1937, **62**, 18. (Determination of bismuth, lead, copper and zinc in one portion of a sample.)
- HANZLIK. Bismuth in Cerebrospinal Fluid after Administration of Iodobismutol. *Arch. Dermatol. Syphilol.*, 1938, **37**, 1003; Abst., *C.A.*, 1938, **32**, 7128.
- HANZLIK, LEHMAN and RICHARDSON. Excretion of Bismuth after Intramuscular Injection of Sobisminol; Experimental and Clinical Results. *J. Pharmacol.*, 1938, **62**, 404; Abst., *C.A.*, 1938, **32**, 4658.
- HANZLIK, LEHMAN, RICHARDSON and VAN WINKLE. Rapid Clinical Method for Estimation of Bismuth in Urine. *Arch. Dermatol. Syphilol.*, 1937, **36**, 725; Abst., *C.A.*, 1938, **32**, 2555. (Yellow-green iodobismuthite compound estimated colorimetrically.)
- HANZLIK, LEHMAN, RICHARDSON and VAN WINKLE. Gastro-intestinal Administration of Sobisminol; Absorption, Distribution and Excretion of Bismuth. *J. Pharmacol.*, 1938, **62**, 54; Abst., *C.A.*, 1938, **32**, 2213. (In rabbits, urinary excretion of Bi small; urinary excretion large.)
- HANZLIK, MEHRTENS and SPAULDING. Irritation and Toxicity of Sodium Iodobismuthite (Iodobismutol) in Propylene Glycol and Diethylene Glycol. *J. Pharmacol.*, 1933, **49**, 300; Abst., *C.A.*, 1934, **28**, 2065. (Solns. in diethylene glycol more toxic.)
- HANZLIK, MEHRTENS and SPAULDING. Iodobismutol: Clinical Excretion of Bismuth. *Arch. Dermatol. Syphilol.*, 1934, **29**, 298; Abst., *C.A.*, 1935, **29**, 223.
- HANZLIK and RICHARDSON. State of Bismuth in Body-fluids and Tissues. *J. Pharm. Exp. Ther.*, 1935, **55**, 447; Abst., *B.C.A.*, 1936, 238A. (Bi always in electronegative state in body.)

- HANZLIK and SPAULDING. Sodium Iodobismuthite (Iodobismitol); Muscular Absorption of Bismuth. *J. Pharm. Exp. Ther.*, 1933, **49**, 257; Abst., *B.C.A.*, 1934, 107A.
- HELLER, KUHLE and MACHEK. Methods for determining the Heavy Metals in Mineral Waters. *Mikrochem.*, 1937, **23**, 78; Abst., *C.A.*, 1938, **32**, 693. (Polarographic methods for determination of Cu, Bi, Zn and Ni.)
- HOULBROOKE and MANLEY. Excretion of Bismuth and its Estimation in Urine and Faeces. *ANALYST*, 1939, **64**, 29.
- HUBBARD. Determination of Bismuth in Biological Material. Photometric Dithizone Method. *Ind. Eng. Chem. Anal. Ed.*, 1939, **11**, 343; Abst., *B.C.A.*, 1939, 954AIII.
- IMOF. Treatment of Tonsillitis with Bismuth. *Munch. Med. Wschr.*, 1938, **85**, 1028; Abst., *B.C.A.*, 1938, 945AIII.
- JORDAN and WALKER. Dermatitis due to Bismuth Compounds. *N.Y. Sta. J. Med.*, 1938, **38**, 483. (Two cases reported.)
- KEITH and OSTERBERG. Acute Bismuth Poisoning, with Recovery. *Arch. Internal. Med.*, 1937, **60**, 474; Abst., *C.A.*, 1937, **31**, 8004. (Report of a case.)
- KEMP and ROSAHN. Oral Administration of Bismuth in Rabbit Syphilis. *Amer. J. Syphilis*, 1936, **20**, 131; Abst., *B.C.A.*, 1939, **83**, AIII. (BiCl<sub>3</sub>, Bi Na Fe citrate and K Bi tartrate non-effective.)
- KIKUCHI. Effect of Colloidal Heavy Metals on the Growth of Transplanted Tumours and their Radiosensitivity. IV. Effect of Colloidal Bismuth and Lead on Radiosensitivity. V. Histological Study of the effect of Colloidal Bismuth and Lead on Rabbit Sarcoma and Rabbit Principal Organs. *Japan J. Obstet. Gynaecol.*, 1936, **19**, 33; Abst., *C.A.*, 1936, **30**, 4920.
- KLAUDER and BROWN. Bismuth Penetration of the Nervous System. Report of Clinical and Laboratory Study. *Arch. Dermatol. Syphilol.*, 1934, **29**, 351; Abst., *C.A.*, 1935, **29**, 223.
- KOLMER, BROWN and RULE. Bismuth Therapy of Syphilis. I. Comparative Study of the Toxicity and Therapeutic Activity of Bismuth Compounds Commonly Employed in Treatment of Syphilis. *Amer. J. Syphilis*, 1939, **23**, 7; Abst., *C.A.*, 1939, **33**, 2978.
- KOLMER, BROWN and RULE. Bismuth Therapy of Syphilis. II. Therapeutic Activity of Bismuth in Syphilis of Rabbits in Relation to its Urinary Excretion. *Amer. J. Syphilis*, 1940, **24**, 415; Abst., *C.A.*, 1940, **34**, 6356.
- KRICHEVSKII and KAGEN. Problem of Direct and Indirect Action in Chemotherapy. IV. Mechanism of the Action of Bismuth on Spirochaets. *Zentr. Bakt. Parasitenk., I. Abt.*, 1932, **126**, 568; Abst., *C.A.*, 1933, **27**, 1908.
- LAUTER, JURIST and CHRISTIANSEN. Preparation, Toxicity and Absorption of Bismuth Compounds. I. Bismuth Salts of Fatty Acids. *J. Amer. Pharm. Assoc.*, 1932, **21**, 1277; Abst., *B.C.A.*, 1933, 312A.
- LAUTER, JURIST and CHRISTIANSEN. Preparation, Toxicity and Absorption of Bismuth Compounds. IV. Bismuth Compounds of Thioloacetic Acid. *J. Amer. Pharm. Assoc.*, 1933, **22**, 212; Abst., *B.C.A.*, 1933, 599A.
- LAUTER, JURIST and CHRISTIANSEN. Preparation, Toxicity and Absorption of Bismuth Compounds. V. Pyrocatechol, Pyrogallol and Gallic Acid. *J. Amer. Pharm. Assoc.*, 1933, **22**, 531; Abst., *B.C.A.*, 1933, 1046A.
- LEHMAN, RICHARDSON and HANZLIK. Determination of Bismuth in Body Fluids and Tissues. *J. Lab. Clin. Med.*, 1935, **21**, 95; Abst., *B.C.A.*, 1937, 504AIII. (Improvements in method of Hanzlik and Mehrtens.)
- LEVADITI, VAISMAN and MANIN. Relation of Antisyphilitic Prevention by Bismuth to the Rate of Elimination of Bismuth in the Urine. *Compt. rend. Soc. Biol.*, 1933, **112**, 442; Abst., *C.A.*, 1933, **27**, 2215.
- LEVADITI, HORNUS, VAISMAN and MANIN. Mechanism of Preventive Action of Bismuth in Experimental Syphilis. *Bull. acad. med.*, 1934, **112**, 513; Abst., *C.A.*, 1935, **29**, 7493.
- LEVADITI and MANIN. Spirochaetocidal Action of Bismuth. *Comp. rend.*, 1934, **199**, 739; Abst., *B.C.A.*, 1934, 1407A. (Bi acts catalytically in same way as Te, As, V and Au.)
- LUCAS. Administration of Bismuth. *Canad. Med. Assoc. J.*, 1938, **38**, 553; Abst., *B.C.A.*, 1938, 687AIII. (Intestinal absorption may occur if suitable compound is used.)
- LUETH, SUTTON, McMULLEN and MUEHLBERGER. Bismuth Poisoning. *Arch. Int. Med.*, 1936, **57**, 1115; Abst., *B.C.A.*, 1936, 1148A. (Case report of a permanent blue discoloration of the skin after treatment with Bi subnitrate.)
- MAECHLING. Separation and Determination of Bismuth and Arsenic in Biological Material. *J. Lab. Clin. Med.*, 1933, **18**, 1058; Abst., *B.C.A.*, 1934, 122A.
- MAEDA. Influence of various Water-soluble Heavy Metal Salts on Blood Glutathione. *Folia. Pharmacol. Japan*, 1934, **18**, No. 2-3, 132; Abst., *C.A.*, 1934, **28**, 6848. (Salts of Bi, Cu, Fe, Hg, and Sb in small quantities increase the glutathione content of the blood of male rabbits.)
- MARTILLOTTI. New Method for the Detection of Bismuth in the Urine. *Pediatrics.*, 1936, **44**, 341; Abst., *C.A.*, 1939, **33**, 8660. (Method based on yellow colour formed by Bi with thiourea.)
- MASCHERPA and CALLEGARI. Method of Introducing Elementary Arsenic, Antimony and Bismuth into Proteins. *Arch. ital. Biol.*, 1934, **91**, 107; Abst., *B.C.A.*, 1936, 619A. (Powdered element shaken with protein soln. in absence of oxygen.)
- MASCHERPA and CALLEGARI. Influence of pH on the Formation of Protein-salt-like Compounds between As, Sb and Bi and Proteins. *Arch. ital. Biol.*, 1934, **91**, 115; Abst., *C.A.*, 1934, **28**, 6740.
- PAPPENHEIMER and MAECHLING. Inclusions in Renal Epithelial Cells after the use of certain Bismuth Preparations. *Amer. J. Path.*, 1934, **10**, 577; Abst., *B.C.A.*, 1935, 1021A.
- PATTE. Liver-Bismuth Combination and Bismuth Asthenia. *Ann. Maladies Vénériennes*, 1937, **32**, 624; Abst., *C.A.*, 1938, **32**, 7130.

(To be continued)