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AN ANNOTATED BIBLIOGRAPHY OF THE POISONOUS AND VENOMOUS FISHES OF AUSTRALIA

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FOREWORD.

In 1943 the Council for Scientific and Industrial Research, in Melbourne, published its Bulletin No. 159, "Poisonous and Harmful Fishes." This Bulletin was originally intended for use by His Majesty's Forces in World War II. In the foreword to that publication it was stated that a more detailed report and a bibliography on the same subject had been assembled for separate publication. No further edition of the Bulletin has been issued, but separate articles on poisonous fishes have appeared. In view of the increased interest in the subject by scientific organizations in the United States, Japan and the Pacific Islands, it was deemed advisable to publish the present bibliography.

The literature of medical ichthyology is extensive and widely scattered throughout scientific journals in a variety of languages. Since a review of the world literature on toxic fishes is not feasible at this time, the present work has been limited chiefly to those publications concerned with the poisonous and venomous fishes of Australia. The term fishes is used in the zoological sense and does not include such invertebrates as jellyfish, shellfish, etc. It will be noted that a number of articles have been listed under the section entitled "General". The works listed in this section are concerned with the more general aspects of the problem of toxic fishes and would be pertinent to a discussion of any area. Papers containing articles on both poisonous and venomous fishes have also been listed in the general section. The remainder of the references have been segregated into the two categories "Poisonous Fishes" and "Venomous Fishes." The term poisonous fishes refers to those whose flesh when ingested by human beings produces toxic symptoms. In contrast, venomous fishes produce their injurious effects by injecting their venom by means of stings or spines. In the latter case the injury is associated with mechanical trauma.

In some instances, e.g., tetraodon poisoning, stingrays, catfishes, etc., it was felt advisable to include certain additional basic papers which were considered to have a bearing on the subject under consideration even though they were not concerned directly with Australian species. It is the hope of the authors that this contribution will stimulate others to conduct research in this greatly neglected field.

GENERAL PAPERS.

ANONYMOUS.

1944.—Survival on land and sea. Office of Naval Intelligence, U.S. Navy: 48-52, 1 fig.

Vernacular names and brief popular descriptions are given for some of the more poisonous and venomous fishes. Precautionary measures are suggested relative to ingesting and handling tropical fishes.

BLANCHARD, R.

1890.—Traité de zoologie médicale. J. B. Bailliere et Fils, Paris, 2: 638-695.

Poisonous, venomous, and electric fishes are briefly discussed. Scientific names are given for a number of species which have been reported dangerous to man.

BOULENGER, G. A.

- 1904.—Fishes. Cambridge Nat. Hist., Macmillan, London, 7 (21): 589-591, 705, 724, 726.

References are made to poisonous, venomous, and electric fishes. Boulenger disagrees with some authors on the poison-organ of *Noturus*, but considers *Trachinus* species to be venomous. Puffers (five genera named) and *Monacanthus* species may be poisonous.

CILENTO, R. W.

- 1944.—Some poisonous plants, sea and land animals of Australia and New Guinea. Smith and Paterson, Brisbane: 23-27.

A general discussion of toxic fishes with quotations from recent authorities concerning various species. *Synanceja horrida*, *Notesthes robusta*, *Dasyatidae* spp., and *Netuma* spp. are named as venomous. *Tetrodon* spp. and *Paradicichthys venenatus* are named as poisonous.

CLELAND, J. B.

- 1912.—Injuries and diseases in man in Australia attributable to animals (except insects). *Australasian Med. Gaz.*, 32 (11, 12): 269-274, 297-299.

A collection of cases involving poisonous and venomous fishes as well as other sea and land animals. Effects of a bite or sting from several species of venomous fishes are included, but the only poisonous fishes named are *Tetraodon* and *Diodon* spp.

- 1932.—Injuries and diseases in Australia attributable to animals (other than insects). Ser. 4, *Med. Jour. Australia*, 1 (19): 159-160.

Specific cases are given of injury from stingrays, stone-fish, and the spike of the bugler fish. One case concerns a poisonous fish and its effect on the persons who ate it.

- 1942.—Injuries and diseases in Australia attributable to animals (insects excepted). Ser. 5, *Med. Jour. Australia*, 2 (14): 314-315.

Recent cases are listed of attacks by sharks and stingrays, bites from a kingfish and a green eel, and poisoning after eating *Callionymus calauropomus* and *Paradicichthys venenatus*. Symptoms and treatment are mentioned briefly under the last-named fish.

COLBY, M. J.

- 1943.—Poisonous marine animals in the Gulf of Mexico. *Proc. Trans. Texas Acad. Sci.*, 26: 62-70.

Poisonous and venomous fishes are discussed briefly under those divisions. Puffers, porcupine fish, barracuda, herrings, and gars have been named as poisonous. Venomous fishes include *Muraena*, sting rays, scorpionfishes, and catfishes. Some invertebrates (jellyfish, mussels, and echinoderms) are also mentioned.

COUTIÈRE, H.

- 1899.—Poissons venimeux et poissons vénéneux. Thesis, Paris, School of Pharmacy.

Poisonous and venomous fishes are listed without comment if they had been previously incriminated. Effects of the poison or venom are discussed in a scientific manner, and cases are cited. It includes some experimental data on fish poisons. One of the more valuable early works.

DEAN, B.

- 1916-23.—A bibliography of fishes. *Amer. Mus. Nat. Hist.*, New York. Vol. 1 (1916), 2 (1917), and 3 (1923).

A comprehensive collection of references to poisonous and venomous fishes appears in the index volume (Vol. 3) on pages 572-574.

FAUST, E. S.

- 1906.—Die tierischen Gifte. Friedrich Vieweg und Sohn, Braunschweig: 134-165.

A scientific presentation of experiments and data on poisonous and venomous fishes. Various types of intoxications are discussed.

- 1924.—Tierische Gifte: Fische, Pisces. *Handbuch Exp. Pharm.*, Berlin, 2 (2): 1841-1854.

This article is essentially the same as the above.

GUDGER, E. W.

- 1930.—Poisonous fishes and fish poisonings, with special reference to Ciguatera in the West Indies. *Amer. Jour. Trop. Med.*, 10 (1): 43-55.

A review of data on venomous and poisonous fishes. *Siluridae*, *Scorpaenidae*, weevers and stingrays are listed as having venomous stings, but the toxicity of *Muraena* bites is questioned. Eel and fish blood is mentioned as a poison. Fishes which are named as poisonous to eat are *Sphyrna barracuda*, *S. picuda*, *Tetrodon maculata*, and *Clupea venenosa*. The clinical characteristics of Ciguatera are described and the Japanese studies of Tetrodotoxin are summarized. An important basic work.

GÜNTHER, A. C.

- 1880.—An introduction to the study of fishes. Adam & Charles Black, Edinburgh: 189-192, 3 figs.

Poisonous fishes (*Clupea*, *Tetrodon*, *Sphyræna*, *Balistes*, *Ostracion*, *Caranx*, *Thynnus*, etc.) are said to become toxic through their diet. Venomous fishes mentioned are the stingrays, Scorpaenids, *Trachinus*, *Symanceia*, *Thalassophryne*, and perhaps some Silurids. Brief anatomical descriptions are given of the venom organs of some species.

HALSTEAD, B. W.

- 1951.—Poisonous fish—a medical-military problem. *Research Reviews* (Office of Naval Research, Washington, D.C.), June: 10-16, 8 figs.

A general review of fish poisoning and its relationship to the armed forces. The clinical characteristics of the disease and theories as to the cause of fish poisoning are reviewed.

- 1953.—Some general considerations of the problem of poisonous fishes and ichthyosarcotoxism. *Copeia*, (1): 31-33.

A general review of the problem of fish poisoning. The article is primarily concerned with definitions of terminology.

JORDAN, D. S.

- 1905.—A guide to the study of fishes. Henry Holt and Co., New York, vol. 1: 182-185; vol. 2: 335, 411, and 413.

Fish poisoning is considered as a defensive measure for the fish. Ciguatera is attributed to an alkaloid. Some poisonous fishes are named.

KOEBERT, R.

- 1902.—Ueber Giftfische und Fischgifte. *Med. Woche*, (19-21): 199-201, 209-212, 221-225.

A report on poisonous and venomous fishes: scientific names, types of poisoning, and causes of poisoning. General information from a wide variety of sources is included.

LEA, A. M.

- 1903.—The poisonous and stinging animals of Tasmania. Folding sheet, reprinted from the *Tasmanian Mail* (November): unpagged, 16 figs.

Illustrates Toadfish and Soldier Fish [*Pentacoptera*]. Case of poisoning through eating Whiting (*Sillago*).

MAASS, T. A.

- 1937.—Gift-tiere. *Tabulae biologicae* (ed. by W. Junk). W. Junk, The Hague, 13: 193-214.

A systematic tabulation of poisonous and venomous fishes and their poisons.

MACHT, D. I., and E. C. SPENCER.

- 1941.—Physiological and toxicological effects of some fish muscle extracts. *Proc. Soc. Exp. Biol. Med.*, 46 (2): 228-233, 1 tab.

The pharmacological effects of fish muscle extracts are reported. Preliminary experiments on plants and mice indicated that the following fish had toxic flesh: *Ameiurus catus*, *Anguilla chrysa*, *Vomer setipinnis*, *Diodon hystrix*, *Spheroides maculatus*, *Pteroplatea mactura*, *Mustelus canis*, *Dasyatis say*, and *Opsanus tau*. Experimental techniques for use in testing fish extracts are given.

MOSSO, A.

- 1888.—Un venin dans le sang des Murenides. *Arch. Ital. Biol.*, 10: 141-169.

A scientific account of a wide variety of experiments to determine the properties of eel and moray blood. The serum is found to be toxic when injected. An important basic work.

NORMAN, J. R.

- 1931, 1936.—A history of fishes. Ernest Benn, Ltd., London, ed. 1 (1931); ed. 2 (1936): 140-145, 3 figs.

A general summary of basic information on poisonous and venomous fishes.

PAWLOWSKY, E. N.

- 1927.—Gifttiere und ihre Giftigkeit. Gustav Fischer, Jena: 245-247 (figs. 114, 115), 406-418 (figs. 166-170), and 478-481.

An excellent general work on poisonous animals, containing comprehensive sections on poisonous and venomous fishes. It is particularly good on the anatomy of the venom organs of fishes. Excellent bibliography.

PELLEGRIN, J.

1899.—Les poissons vénéneux. Thesis 510. Ollier-Henry, Paris: 1-121, 16 figs.

A comprehensive systematic review of poisonous fishes. Only brief mention is made of venomous fishes. Numerous case histories are included and treatment is discussed.

PHISALIX, M.

1922.—Animaux venimeux et venins. Masson et Cie., Paris, 1: 487-628, figs. 194-232, pls. 4 and 5.

The most comprehensive work in existence on the general subject of poisonous and venomous animals. It contains a great deal of experimental data and an excellent bibliography.

1931.—Prophylaxie et traitement des piqûres venimeuses de poissons. *Notes*, Station Océanogr. Salammô, No. 23: 1-6.

A scientific account of the properties of fish venom. Treatment for fish stings is described.

PRYOR, J. C.

1918.—Naval hygiene. Blakiston, Philadelphia: 153-155, 309-318, 2 figs.

A general report on toxic fishes as they relate to naval personnel. It lists about two dozen important species.

SAVTSCHENKO, P.

1886.—Atlas des poissons vénéneux, descriptions des ravages produits par eux sur l'organisme humain, et des contre-poisons à employer. (Text in Russian and French.) St. Pétersbourg: 1-55, 19 pls.

One of the most complete of the early works on poisonous and venomous fishes. It contains a general discussion of the problem, descriptions and figures of about 45 species. An important work.

SCOTT, H. H.

1921.—Toxicology. The practice of medicine in the tropics (ed. by W. Byan and R. G. Archibald). Frowde and Hodder and Stoughton, London, vol. 1, sect. 6: 790-798, pls. 34-35, and figs. 323-327.

Some of the better-known species of poisonous and venomous fishes are discussed. Figures are supplied to assist the general reader in identifying dangerous fishes.

STRONG, R. P.

1944.—Stitt's diagnosis, prevention and treatment of tropical diseases, 7th ed. Blakiston, Philadelphia, 2: 1544-1547, 1 fig.

Several poisonous and venomous fishes are named with general comments on their effects. Those considered poisonous are *Tetrodon*, *Diodon*, and *Meletta* species, and barracuda. Venomous fishes listed are *Muraena*, *Trygon*, *Trachinus*, and *Scorpaena*.

TENISON-WOODS, J. E.

1882.—Fish and fisheries of New South Wales. Thomas Richards, Sydney: 30-91.

This chapter on marine food fishes contains many scattered references to poisonous and venomous fishes. It is written primarily from the standpoint of the angler.

TYBRING, O.

1887.—Poisonous fish. *Bull. U. S. Fish. Comm.*, 6 (1886): 148-151.

Cases of fish poisoning are cited from many parts of the world, naming the fish involved where possible. Venomous fishes are only casually mentioned. The paper is too general to be of great value.

WHITLEY, G. P.

1930.—Ichthyological miscellanea. *Mem. Queensland Mus.*, 10 (1): 8-31, 1 pl., 1 fig.

Brief reference is made to the occasional toxicity of *Paradicichthys venenatus*, and to the work of Duhig and Jones on the venomous properties of Australian stonefish (*Synanceja* spp.).

1940.—Fishes of Australia. Sydney and Melbourne Pub. Co., Sydney, Part I: 63, 153, 194-199.

The book deals with sharks, rays, and fish-like animals. Venomous properties of *Trygon*, *Scorpaena*, and *Trachinus* are mentioned. Reference is made to the purgative and toxic effects of shark flesh.

1943.—Poisonous and harmful fishes. *Council Sci. Indust. Res. Bull. No. 159*, Melbourne: 1-28, 3 pls., 16 figs.

Popular descriptions are given of all common poisonous or venomous fishes of Australia or the south-western Pacific. A practical guide to protect those who have not studied toxic Australian fishes.

POISONOUS FISHES.

ANDERSON, W.

- 1776.—An account of some poisonous fish in the South Seas. *Philos. Trans. Roy. Soc., London*, 66: 544-552.

One of the first published accounts of fish poisoning in the South Seas. It gives a clinical résumé of an outbreak involving several persons poisoned from eating *Sparus pagrus*, and it states that Captain Cook was poisoned from eating a *Tetraodon*.

ANONYMOUS.

- 1821.—*Sydney Gazette* (April 21): 2, 3.
Coroner's inquest on man poisoned by toadfish at Parramatta.
- 1831.—*The Colonial Times*, Hobart (March 29, April 5).
Coroner's inquest on three victims of toadfish poisoning.
- 1831.—*Sydney Herald*, 1 (1): 4.
Toadfish poisoning at New Town, Tasmania.
- 1839.—Barracouta of the West Indies. *Nautical Magazine*, 8: 256.
Silver test not infallible.
- 1871.—Editorial on *Tetraodon hamiltoni*. *New South Wales Med. Gaz.*, 1 (10): 305-309.
The author warns against eating *Tetraodon hamiltoni* and summarizes several cases of poisoning from eating it and other *Tetraodon* species.
- 1874.—Poisonous fish. *Sydney Morning Herald* (July 7): 5.
Lady had convulsions from eating fish—blackfish, garfish and trout—from Sydney, at Wagga, 2/7/74. Recovered.
- 1899.—The "Palu" or "oil-fish" of Funafuti. *Nature*, 60 (1561): 536.
A brief note giving a popular description of the oilfish and identifying it as *Ruvettus pretiosus*, which is well-known for its purgative properties.
- 1943.—Poisonous and Dangerous Fishes of the Tropical Pacific. Prepared by the Arctic, Desert and Tropic Information Center, Eglin Field, Florida. *Informational Bulletin A*, 11: 1-15, illustr.
A guide for servicemen.
- 1950.—*Daily Telegraph* (newspaper), Sydney (December 9-12).
Toadfish poisoning.
- 1951.—*Sydney Morning Herald* (March 6).
Woman dies, family ill, after eating toad fish.
- 1951.—*Sun* (newspaper), Sydney (March 7): 14.
Same as 1950, 1951 cases.

AUTENRIETH, H. F.

- 1833.—Ueber das Gift der Fische. C. F. Osiander, Tubingen: 1-287.

Fishes which had been reported as poisonous are enumerated with comment. Much of the book is devoted to a semi-popular account of fish poisons. A useful work.

BACKHOUSE, J.

- 1843.—A narrative of a visit to the Australian colonies. Hamilton, Adams, London: 186-187.

Toadfish poisoning, Hobart, 1831.

BENNETT, G.

- 1871.—On the "toad fish" (*Tetraodon hamiltoni*) of New South Wales. *New South Wales Med. Gaz.*, 1 (6): 176-181, 1 pl.

A figure and description of *Tetraodon hamiltoni* are given with a warning against eating it. Several cases are cited of poisoning from eating *Tetraodons*.

BRENCHLEY, J. L.

- 1873.—Jottings during the cruise of H.M.S. "Curaçoa" among the South Sea Islands in 1865. Longmans, Green and Co., London: 60, 135, 200, 213, 214, 231.

Random notes are included on poisonous fishes at the various South Sea Islands. The work is of minor importance.

BURROWS, W.

- 1945.—Periodic spawning of "palolo" worms in Pacific waters. *Nature*, 155 (3924): 47-48.

The author states that reef fishes become poisonous for 10 to 14 days after the swarming of the palolo worm.

CILENTO, R. W.

1940.—Tropical diseases in Australasia. Smith and Paterson, Brisbane: 339-340.

Chapter 16 was slightly revised and published as "Some poisonous plants, sea and land animals of Australia and New Guinea (notes for medical nursing and ambulance staffs)." Brisbane, 1944: 23-25. Notes treatment of wounds from venomous fishes and for toadfish and chinaman fish poisoning.

COOK, J.

1777.—A voyage towards the South Pole and around the world, ed. 3, London, 2: 112-113.

This is one of the first published experiences concerning poisonous fish. Captain Cook described the predominant symptoms and treatment of his illness after eating a fish "something like a sunfish" [now known as a puffer, *Pleuranacanthus sceleratus*].

CROWTHER, W. E. L. H.

1954.—The Rontgen Oration. Practice and personalities at Hobart Town, 1828-1832, as indicated by the Day Book of James Scott, M.D., R.N., Senior Colonial Surgeon. *Med. Journ. Austr.*, 1, 41st year, 12: 421-430, figs. 1-8.

Toadfish poisoning in Tasmania.

DALRYMPLE, A.

1775.—An historical collection of the several voyages and discoveries in the South Pacific Ocean. J. Nourse, London: 1, 140-141.

Early English translation of Quiroz's account of men having been poisoned by pargos in 1606.

DEMPSTER, G. O. L.

1949.—Fish poisoning. *Brit. Med. Jour.*, 1 (4608): 775.

The author takes issue with the theory that fishes become toxic because of the dumping of war matériels, stating that he saw entire villages in the South Pacific sick with fish poisoning during the 1930's. He believes fish become poisonous as a result of eating a poisonous marine growth.

DEWBERRY, E. B.

1938.—Food Poisoning. *Food Manufacture*, London, 13, 8, Aug., 1938: 275-276.

Brief mention of symptoms of fish poisoning and signs of decomposition in fish.

DUMERIL, A.

1866.—Des poissons vénéneux. *Ann. Soc. Linn. Depart. Maine-et-Loire*, 8: 1-17.

This article in English translation appeared as follows:

1867.—On venomous fishes. *Ann. Mag. Nat. Hist.*, ser. 3, 20 (117): 153-167.

A study of poisonous fishes, not venomous ones. It names, as poisonous, fishes in the following genera: *Meletta*, *Tetraodon*, *Diodon*, *Balistes*, *Caranx*, *Scarus*, *Thynnus*, *Engraulis*, and others. Some case histories are outlined, and typical symptoms are described in detail, with treatment. Causes for toxicity of fish are discussed briefly.

DUNCAN, C.

1951.—A case of toadfish poisoning. *Med. Jour. Australia*, 2 (20): 673-675.

Clinical history and post-mortem are described in a fatal case of poisoning from *Sphaeroides uosomus*. Some general discussion on fish poisoning is included.

EVERMANN, B. W., and T. H. SHAW.

1927.—Fishes from Eastern China, with descriptions of new species. *Proc. Calif. Acad. Sci.* (4) 16: 122.

Cooking of toadfish, *Sphaeroides ocellatus*, so that it is not poisonous; (not explained).

FLECKER, H.

1946.—Thread finned sea perch, *Lutjanus nematophorus* (Bleeker). Is this fish poisonous? *Fisheries Newsletter* (Cronulla), 5, 4: 18.

No reliable evidence that this fish, also known as Chinaman Fish, is poisonous.

FORSTER, J. R.

1778.—Observations made during a voyage round the world. London: 209-211, 642-649.

A new species of *Tetrodon* [later named *sceleratus*] affected as a powerful poison the three men who ate it. He also mentions a poisonous *Sparus* from Mallicolo and describes symptoms of both forms of poisoning in men and animals.

1844.—Descriptiones Animalium (ed. Lichtenstein), Berlin: 254 and 282.

Poisoning by *Tetrodon sceleratus*.

GILL, W. W.

1876.—Life in the Southern Isles. Religious Tract Society, London, 1876: 274.

Fish poisonous in certain parts of Cook Islands, not in others; poison ascribed to their eating a Nereid worm.

GILMAN, R. L.

1942.—A review of fish poisoning in the Puerto Rico-Virgin Islands area. *U.S. Naval Med. Bull.* 40, 1: 19-27, pls. 5 and 6.

A report of ten cases occurring on Culebra Island.

GRIMBLE, [Sir] A.

1933.—The migrations of a pandanus people. *Suppl. Journ. Polynes. Soc. (Memoir No. 12.)* 42, Instalment 1: 17-19.

Poisonous Fishes, Gilbert Islands.

HALSTEAD, B. W.

1951.—Ichthyotoxism, a neglected medical problem. *Med. Arts Sci.*, 5 (4): 115-121, 8 figs.

A general account of the problem of fish poisoning. Clinical characteristics and causes of fish poisoning are discussed.

1954.—A note regarding the toxicity of the fishes of the Skipjack family, Katsuwonidae. *Calif. Fish and Game*, 40: 61-63.

Poisoning from eating *Euthynnus* at Johnston Island and *Katsuwonus* in the Philippines.

HALSTEAD, B. W., and N. C. BUNKER.

1953.—The effect of the commercial canning process upon puffer poison. *Calif. Fish and Game*, 39 (2): 219-228, 4 figs., 1 tab.

A review of chemical studies of the poison. Results of experiments in canning puffers are tabulated, showing that the process affects some species by reducing toxicity. Other species may become completely non-toxic, and in some the poison does not appear to be affected by canning. Clinical characteristics of poisoning are mentioned.

1954.—A survey of the poisonous fishes of the Phoenix Islands. *Copeia*, 1954, 1: 1-11, figs. 1-5.

Collection of material; toxicity tests; public health significance.

HALSTEAD, B. W., and W. M. LIVELY.

1954.—Poisonous fishes and ichthyosarcotoxism. *U.S. Armed Forces Med. Jour.* 5, (2): 157-175, figs. 1-13.

A discussion on the military importance of poisonous fishes. Includes a classification of fish poisoning into four types: puffer poisoning, *Gymnothorax* poisoning, ciguatera, and scombroid poisoning. Case reports for ciguatera are detailed.

HALSTEAD, B. W., and R. J. RALLS.

1954.—Results of dialyzing some fish poisons. *Science*, 119, (3083): 160-161.

Experiments indicate that toxins from four poisonous species (*Fugu*, *Gymnothorax*, *Lutjanus*, and *Caranx*) are small water-soluble molecules.

HARRY, R. R.

1953.—Ichthyological Field Data of Raroia Atoll, Tuamotu Archipelago. *Atoll Res. Bull.* 18: 1-190, figs. 1-7.

Poisonous fishes (pp. 71, 117, 167 and 177); venomous fishes (pp. 151, 156 and 177).

HASHIMOTO, Y.

1950.—On the toxicity of a puffer, "nashi-fugu". (Text in Japanese.) *Bull. Jap. Soc. Sci. Fish.*, 16 (2): 43-46, 1 fig., 2 tabs.

Results of experiments on the toxicity of *Sphaeroides vermicularis radiatus* indicate that the ovary and liver are the most poisonous organs, although individual specimens vary greatly in toxicity.

HASHIMOTO, Y., and M. MIGITA.

1951.—Quantitative analysis method for fugu (puffer) toxin. (Text in Japanese.) *Bull. Jap. Soc. Sci. Fish.*, 16 (8): 341-346.

A technical report on experiments with fugu toxin, including details of methods used to extract the poison and a comparison of the dose-effect curve of fugu with shell-fish toxin.

HERRE, A. W.

- 1924.—Poisonous and worthless fishes. *Philipp. Jour. Sci.* 25, 4: 415-510, pls. 1 and 2; 27, 2, 1925: 167-168.

Taxonomic review of Philippine species likely to be poisonous to eat.

HILL, E. S.

- 1871.—Sydney Mail (March 4, 1871): 22; (June 3): 426.

Two boys poisoned by toadfishes at Coogee, New South Wales.

- 1880.—Fishes of and fishing in New South Wales. *Rept. Roy. Comm. Fisheries, New South Wales*, Appendix D, (14): 20-21.

Poisonous fishes, toad fishes, porcupine fishes.

HIROA, TE RANGI.

- 1938.—Ethnology of Mangareva. *Bernice P. Bish. Mus. Bull.* 157: 301.

Quotes 1856 MS. of Laval on poisonous fishes.

HIYAMA, Y.

- 1943.—Report on the research of poisonous fish in the South Seas. (Text in Japanese.) *Nissan Fish. Inst.*, Odawara, Japan: 1-137, 29 pls.

Toxicity of many different species is discussed; local names, morphology and distribution of the fishes are included. A large part of the work consists of tables which illustrate the degree of toxicity of various fishes. Experiments on the toxic substances, especially in puffer, are described. Also mentioned are typical symptoms of poisoning, popular theories of the cause of toxicity, and variations in toxicity. A valuable work.

HORA, S. L.

- 1948.—Knowledge of the ancient Hindus concerning fish and fisheries of India. *Jour. Roy. Asiatic Soc. Bengal*, 14: 7-10.

Method of rendering flesh of fish poisonous to enemies in ca. 300 B.C. Parallel modern cases.

INGLETON, G. C.

- 1952.—True patriots all. Angus & Robertson, Sydney: 88 and 265, 1 fig.

Cases of toadfish poisoning.

ISHIHARA, F.

- 1918.—Über die physiologischen Wirkungen des Fugutoxins. *Mitt. Med. Fak. Univ. Tokio*, 20: 375-426, 3 pls.

An excellent and thorough study of the physiological effects of fugutoxin. The reactions of various organ systems and various animals to the toxin are recorded.

- 1924.—Studien über das Fugutoxin. *Arch. Exp. Path. Pharm.*, 103: 209-218.

An excellent scientific report on the chemical and pharmacological properties of puffer toxin.

JONES, H. W.

- 1940.—Index-catalogue of the library of the Surgeon-General's office, United States Army. (4) 5: 1006-1012.

Many references to fish poisoning.

JORDAN, D. S.

- 1929.—Poisonous fishes in Samoa. *Amer. Naturalist*, 63 (687): 382-384.

A report of ten types of fish which may cause poisoning. It lists twelve types which are always edible.

KAEMPFER, E.

- 1727.—The history of Japan. (English ed.) London, vol. 1: 134, pl. 11, 2 figs.

Toadfish poisoning.

KERGUELEN, Y. J. de.

- 1772.—Voyage dans l'Inde et aux Terres Australes en 1771-1772. MS. unpublished, in Hydrographic Dept., Paris; copy in Mitchell Library, Sydney: folio 262.

Poisonous toadfish of Western Australia.

KIMURA, S.

- 1927.—Zur Kenntnis der Wirkung des Tetrodongiftes. *Tohoku Jour. Exp. Med.*, 9: 41-65, 7 figs., 7 tabs.

A fairly complete scientific report of the action of tetrodotoxin in animals. Physiological effects in various experiments were observed and recorded.

KITSON, A.

- 1907.—Captain James Cook, R.N., F.R.S. "The Circumnavigator", John Murray, London: 289, 298.

Fish poisoning on Cook's Expedition.

LARSEN, N. P.

- 1942.—Tetrodon poisoning in Hawaii. *Proc. 6th Pac. Sci. Cong. Berkeley*, 5: 417-421.

A review of literature on tetrodon poisoning with a clinical history of three cases in Hawaii. Experiments conducted by the author yielded a white crystal which poisoned laboratory animals. The theory that the poison may come from unusual dietary habits was propounded, since cases of poisoning are rare in Hawaii.

LEE, R. K. C., and H. Q. PANG.

- 1945.—Ichthyotoxism—fish poisoning. *Amer. Jour. Trop. Med.* 25: 281-285.

This report is concerned with two outbreaks of fish poisoning which occurred in Honolulu following the eating of fishes which had been imported from Midway and Christmas Islands. It also contains a number of case histories and a brief review of the problem of fish poisoning.

LEGROUX, R., D. BOVET, and J. C. LEVADITI.

- 1947.—Présence d'histamine dans la chair d'un thon responsable d'une intoxication collective. *Ann. Inst. Pasteur*, 73 (1): 101-104.

A report on a series of experiments which showed histamine to be the cause of poisoning from eating tuna. Possible causes for production of histamine are discussed.

LORD, C., and H. H. SCOTT.

- 1924.—A synopsis of the vertebrate animals of Tasmania. Oldham, Beddome & Meredith, Hobart: 94.

Toadfish poisoning.

McCoy, F.

- 1867.—On the recent zoology and palaeontology of Victoria. *Offic. Record Intercol. Exhib.* 1866-67: 316.

"Salmon," *Arripis georgianus*, poisoning.

MARKHAM, C.

- 1904.—The voyages of Pedro Fernandes de Quiroz, 1595 to 1606. Hakluyt Society, London (2), 14-15, vol. 1: 263; vol. 2: 390, 447.

Pargos poisoning members of Quiroz's expedition in the New Hebrides, May 27, 1606.

MARTIN, R. M.

- 1835.—History of the British colonies. James Cochrane and Co., London, 4: 436-439.

Brief reference is made to three persons being fatally poisoned as a result of eating puffer.

MEREDITH, L. A.

- 1844.—Notes and sketches of New South Wales. John Murray, London: 155. (Reprinted by: Newman, Edward (1846), *Zoologist*, [4]: 1341.)

Toadfish poisoning [evidently referring to Mrs. Bell's death in Tasmania in 1831].

MOORE, G. F.

- 1884.—Diary of ten years eventful life of an early settler in Western Australia. M. Wallbrook, London: 418.

Aboriginal at Rottneest I. poisoned by eating blow-fish in 1840.

MURRAY, J.

- 1870.—Poisonous, or moon-struck fish. *Australian Med. Gaz.* (August): 133-135.

Ascribes poisonous qualities to fish having been left in moonlight. Case of poisoning through eating barracouta [evidently "milky" fish whose condition was due to protozoan parasites—G.P.W.].

OGILBY, J. D.

- 1954.—Commercial Fishes and Fisheries of Queensland. Govt. Printer, Brisbane: 49-53, 102.

Poisoning by Red Bass (*Lutjanus coatesi*): chinaman fish and trigger fishes dangerous to eat.

OMMANEY, H. M.

- 1834.—MS. report in Public Records Office, London; copy in State archives, Perth, West Australia, August 16, 1834—Quoted by Whitley, 1953: 62.

Death from eating a fish (? *Tetrodon*).

PARADICE, W. E. J.

- 1926.—Fish and other marine animals of Australia of special interest. *Health Inspect. Assoc. Austr. Quart. Rev.*, 4 (3): 43-48, 2 pls.

Includes notes on various fishes poisonous to eat, or with venomous spines.

PATTISON, G. J.

- 1872.—Toad fish. *New South Wales Med. Gaz.*, 2 (5): 138-140.

The author presents cases of eating toadfish flesh without ill effects. He has eaten it himself and has fed it to cats and to a dog.

- 1872.—Fish poisoning. *New South Wales Med. Gaz.*, 2: 145.

Medical treatment is described for five children who were poisoned by eating sardines.

POEY, F.

- 1866.—Ciguatera. Memoria sobre la enfermedad ocasionada por los Peces venenosos. *Repert. Fisico-Nat. Cuba*, 2 (1): 1-24, and 2 (2): 25-39.

An annotated list of seventy species of fishes suspected of being poisonous in the Caribbean area. Causes of poisoning, symptoms, precautions and curative measures. [Copy in G.P.W. library.]

ROSS, S. G.

- 1947.—Preliminary report on fish poisoning at Fanning Island (Central Pacific). *Med. Jour. Australia*, 2: 617-621, 3 tabs.

This account involves 95 cases of fish poisoning which occurred at Fanning Island during 1945 to 1947. Author summarizes the clinical characteristics of the outbreak and discusses theories as to the cause of fish poisoning.

SCOTT, J.

- 1832.—The poisonous or toad fish of Van Diemen's Land. *The Hobart Town Almanack* for the year 1832: 89-90, 1 pl.

Historic account of poisoning of a family in Tasmania [by *Sphaeroides glaber*].

SOMERVILLE, J. D.

- 1946.—Poisonous fish. *South Australian Naturalist*, 24 (1): 12, 13.

The poisoning of Captain Cook is quoted from G. A. Wood's *The Discovery of Australia*.

SPAREMAN, A.

- 1944.—A voyage round the world with Captain James Cook in H.M.S. Resolution. Golden Cockerell Press, London: 23, 147 and 167.

Symptoms of redfish and *Tetrodon* poisoning.

SPOFFORTH, J. L.

- 1887.—A case of poisoning by eating part of a toad-fish. *Australasian Med. Gaz.*, 6: 266.

A brief medical report of symptoms and post-mortem findings in a fatal case of poisoning by a *Tetraodon*.

STEPHENSON, J.

- 1838.—Medical zoology and mineralogy. John Churchill, London: 121-128, 3 pls.

An account of symptomatology and other data on poisoning by *Megalops thrissa* (*Clupea*), *Sphyræna barracuda*, *Tetraodon ocellatus*, and *T. sceleratus*.

STEVENS, H. N.

- 1930.—New light on the discovery of Australia (Journal of Diego de Prado y Tabor). Hakluyt Society, London: 127.

Concerning the jaundiced fish, pargos, of Quiróz's expedition.

SUEHIRO, Y.

- 1947.—Practice of fish physiology. Poison of globe fish. (Text in Japanese). Tokyo Imper. Univ.: 140-159.

This includes a review of Japanese work on puffer poison, a list of poisonous fishes, and physiological and chemical studies of the poison. An important work.

- 1948.—On the physiological function of the puffer-fish poison. (Text in Japanese.) *Suisan Gakkai Ho*, 10 (12): 1-5, 1 tab.

Experiments with pufferfish poison (*Sphaeroides alboplumbus*) on various animals are tabulated. Some information is included on methods and interpretation of results. A valuable work.

TAHARA, Y.

1910.—Über das Tetrodongift. *Biochem. Zeitschr.*, 30: 255-275.

One of the more important original chemical studies on puffer poison. It includes also some data on physiological effects of the poison.

THOMPSON, L.

1940.—Southern Lau, Fiji: an ethnography. *Bernice P. Bish. Mus. Bull.*, 162: 137.

Fijian fishes poisonous since 1929 hurricane, perhaps due to seaweed.

TITCOMB, M., and M. K. PUKUI.

1951.—Native use of fish in Hawaii. *Journ. Polynes. Soc.* 60: Memoir 29: 30-32.

Fishes poisonous as food.

WAITE, E. R.

1897.—The mammals, reptiles and fishes. *Austr. Mus. Mem.* 3: 182.

Fishes at Funafuti regarded as poisonous when pumice drifted into lagoon.

WHITLEY, G. P.

1932.—The Chinaman fish. *Australian Mus. Mag.*, 4 (11): 394-396, 2 figs.

The varying toxicity of *Paradicichthys venenatus* is discussed, with a taxonomic description and account of its habits.

1934.—A new fish, reputed to be poisonous, from Queensland. *Mem. Queensland Mus.*, 10 (4): 175-179, 1 pl., 1 fig.

A taxonomic description of *Lutjanus coatesi*, which is "reputedly poisonous".

1942.—Poisonous fishes. *Fisheries News Letter (Cronulla)*, 1 (5): 5-9.

Toadoes, Chinaman Fish, Red Bass, etc.

1953.—Toadfish poisoning. *Australian Mus. Mag.*, 11 (2): 60-65, 6 figs.

A review of toadfish poisoning in Australia with a warning against any of the species and especially against *Pleuranacanthus sceleratus*, *P. lunaris*, *Contusus richet*, *Ovoides nigropunctatus*, *Sphaeroides hamiltoni*, *S. glaber* and *S. pleurogramma*.

1954.—Are Hussars edible? *Australian Mus. Mag.* 11 (6): 194-199, 5 figs.

Various Lutjanidae discussed.

YANO, I.

1937.—The pharmacological study of tetrodotoxin. (Text in Japanese.) *Fukuoka Med. Coll. Jour.*, 30 (9): 1669-1704.

Details are given of experiments with tetrodotoxin on laboratory animals. The author describes the effect of varying doses on vascular and nervous systems. Tetrodotoxin does not produce immunity.

1938.—An experimental study of the globe-fish (fugu) intoxication. *Japanese Jour. Med. Sci.*, 8 (5): 99-101.

A study of the effect of tetrodotoxin on blood-pressure in laboratory animals.

YOKOO, K.

1948.—Chemical study of tetrodotoxin. Report No. 1. (Text in Japanese.) *Riken Iho*, 24 (3): 136-139.

A study on the chemical properties of the poison of *Sphaeroides rubripes*.

1948.—Chemical studies on tetrodotoxin. Report No. 2. (Text in Japanese.) *Hiroshima Igaku* (Hiroshima Medical School), Report 1, No. 2: 52-53.

The first report is thoroughly reviewed, and modified methods of purifying the toxin are described.

1950.—Chemical studies on tetrodotoxin. Report No. 3, Isolation of Spheroidine. (Text in Japanese.) *Nihon Kagaku Zasshi, Japanese Chem. Jour.*, 71 (11): 590-592.

The first two reports are reviewed, and an outline is given of chemical experiments to isolate and study a toxic substance which Yokoo calls Spheroidine. A valuable series of reports.

YUDKIN, W. H.

1944.—Tetrodon poisoning. *Bull. Bingham Oceanogr. Coll.*, 9 (1): 1-18, 1 fig.

A concise scientific treatise on tetrodon poisoning. It briefly reviews history, chemical characteristics of the poison and symptomatology. An important paper.

VENOMOUS FISHES.

AFLALO, F. G.

- 1896.—A sketch of the natural history of Australia. Macmillan, London: 228, 247.
Fortescue, etc. Brief note.

BANFIELD, E. J.

- 1908.—The confessions of a beachcomber. Fisher Unwin, London: 143-145, 1 plate.
Popular account of Stonefish.

BAYLEY, H. H.

- 1940.—Injuries caused by scorpion fish. *Trans. Roy. Soc. Trop. Med. Hyg.*, London, 34 (2): 227-230, 1 pl.
Typical symptoms of scorpion fish wounds are recorded with medical treatment. An incomplete taxonomic description is given for the two species *Scorpaena plumieri* (Bloch) and *S. grandicornis* (Cuv. and Val.).

BOTTARD, A.

- 1889.—Les Poissons Venimeux. Octave Doin, Paris: 1-198, 34 figs.
A valuable historical review on venomous fishes. The author discusses various types of stinging and biting fishes, describes venom organs, and suggests treatment for wounds from fish. An important work.

BURGESS, J.

- 1926.—Sting ray injuries. *Med. Jour. Australia*, 2 (14): 465-466.
Clinical characteristics are given for three cases of stingray wounds.

BYRNE, K.

- 1924.—Injuries and diseases in Australia attributable to animals. *Med. Jour. Australia*, 2: 539.
Synanceja horrida is described as a venomous fish; other animals are mentioned.

CALDWELL, N.

- 1938.—Titans of the Barrier Reef. Angus & Robertson, Sydney. November: 80-81.
Stings from stingrays.

CASTELLANI, A., and A. J. CHALMERS.

- 1919.—Manual of tropical medicine. Wm. Wood and Co., New York, ed. 3: 230-241, 4 figs.
Lists the venomous fishes by zoological classification. Examples of each type are given, e.g., *Muraena*, *Synanceja*, *Thalassophryne*, *Trachinus*, and the stingray, with some concise general information.

CLELAND, J. B.

- 1916.—Injuries and diseases of man in Australia attributable to animals, except those due to snakes and insects (No. 2). *Rept. Direct.-Gen. Public Health New South Wales*, 1915: 266-276.
Injuries from Stingrays and Bullrout; references to toadfish poisoning.
- 1924.—Injuries and diseases in Australia attributable to animals (except insects). *Med. Jour. Australia*, 11 (2): 339-345.
Shark-bites, numb-fish, catfish, fortescue, stingrays, *Kathetostoma*, black trevalli, toadfish.
- 1942.—Injuries from animals. *Med. Jour. Australia*, 2 (22): 490-491.
Two cases of injury are described: one from eating mussels and one from being stung by a catfish. Treatment of the catfish sting is reported.

COOK, H.

- 1950.—Venomous marine animals in Australian waters. *Illustrated London News*, (4th March): 340, 3 figs.
An interesting popular account on the Australian venomous stonefish, scorpionfish and stingrays.

DANE, P. G.

- 1926.—Sting ray injuries. *Med. Jour. Australia*, 2 (20): 677.
This note describes treatment given for a stingray injury.

DUHIG, J. V.

- 1929.—The nature of the venom of *Synanceja horrida* (the stonefish). *Zschr. Immunforsch.*, 62 (3-4): 185-189, 2 figs.

An account of the experiments used to determine the nature of *Synanceja horrida* venom.

DUHIG, J. V., and G. JONES.

- 1928.—The venom apparatus of the stonefish (*Synanceja horrida*). *Mem. Queensland Mus.*, 9 (2): 136-150, 8 figs.

An important report on the anatomy of the venom organ of *Synanceja horrida*. Clinical notes on a case of wounding by stonefish are supplied by M. J. Gallagher.

- 1928.—Haemotoxin of the venom of *Synanceja horrida*. *Australian Jour. Exp. Biol.*, (2): 173-179, 6 tabs.

A report on the haemotoxic properties of stonefish venom. Quantitative experiments were made with the venom on guinea-pig, sheep and human red blood cells. The venom is said to have physiological properties similar to cobra venom and curare.

EVANS, H. M.

- 1916.—The poison-organ of the sting-ray (*Trygon pastinaca*). *Proc. Zool. Soc. London*, 29 (1): 431-440, 7 figs.

A report on the histology of the sting and venom gland of the stingray, *Trygon*. It presents evidence that the secretion is actually a venom. A very important paper on the subject.

- 1920.—The poison of the spiny dog-fish. *Brit. Med. Jour.*, 1 (3087): 287-288, 5 figs.

A discussion on the histology of the spine of *Acanthias vulgaris*, with mention of a person who was wounded by a dogfish spine.

- 1921.—The poison organs and venoms of venomous fish. *Brit. Med. Jour.*, 2 (3174): 690-692, 2 figs.

A general summary of information about *Trygon*, *Trachinus*, and *Scorpaena*, from Aristotle to modern times. It gives briefly the anatomical location of the venom glands in the spines of *Scorpaena*, *Synanceja*, and *Thalassophryne*. Several experiments were performed to show the effects of this venom on fish and laboratory animals. Treatment for wounds is discussed.

- 1923.—The defensive spines of fishes, living and fossil, and the glandular structure in connection therewith, with observations on the nature of fish venoms. *Philos. Trans. Roy. Soc. London*, ser. B, 212: 1-33, 3 pls., 14 figs.

A valuable histological study of the venom organs of some venomous fishes (*Trygon pastinaca*, *Acanthias vulgaris*, *Cestracion philippi* and *Chimaera monstrosa*). Experiments with *Trachinus draco* venom are described.

- 1924.—The poison gland of *Trygon*—supplementary note. *Proc. Roy. Soc. London*, ser. B, 96: 491-493, 2 figs.

Additional histological experiments confirm the presence of a venom gland in a stingray (*Trygon*).

- 1943.—Sting-fish and seafarer. Faber and Faber, London: 1-180.

This book discusses weevers (*Trachinus*), other stingfish, stingrays, scorpionfish, *Muraena*, other eels, surgeonfish, triggerfish, catfish, electric fish, jellyfish, and others. Scientific names are given wherever possible, and histological descriptions of the venom organs appear often. The book is written in a popular style but contains a great deal of valuable information.

- 1944.—Sharks: vicious and venomous. *Lancet*, (2) 247 (6331): 859-860.

Listed as venomous sharks are the spiny dogfish, the Port Jackson shark and the chimaeras. They are said to have venom glands connected with their spines. The article is of minor importance.

- 1945.—Toxic properties of sting-ray's sting. *Brit. Med. Jour.*, 4413: 165.

Clinical notes on cases of stingray wound in the Bay of Bengal are given. Effects of stings from the stingray and from jellyfish are compared.

FROES, H. P.

- 1933.—Studies on venomous fishes of tropical countries. *Jour. Trop. Med. Hyg.*, 36: 134-135, 2 figs.

A brief report on experimental work showing that the venom of *Thalassophryne* acts as a neurotoxin.

GILL, W. W.

- 1874.—Natural history anecdotes, Poisonous fish. *Sydney Morning Herald* (January 8): 3; *Sydney Mail* (January 10): 50.

Crab, nereid, fish and cone-shell, Hervey Islands.

- 1888.—Zoologische Miscellan aus der Südsee. *Mitteil. Geogr. Ges. Thuringen*, Jena, 7: 18-37.

Especially pp. 22-24, stingrays, and 24-25 stonefish.

GUDGER, E. W.

1943.—Is the stingray's sting poisonous? *Bull. Hist. Med.*, 14 (4): 467-504, 12 figs.

An excellent historical résumé of the venomous properties of stings of stingrays. An important historical work.

1947.—Is the stingray's sting poisonous to vertebrates other than men and fishes? *Amer. Naturalist*, 81: 297-307, 4 figs.

This paper is essentially a review of the work of J. Vellard (1931) which showed that vertebrates other than man are affected by the venom of stingrays.

HALSTEAD, B. W., and N. C. BUNKER.

1952.—The venom apparatus of the ratfish *Hydrolagus collicii*. *Copeia*, (3): 128-138, 1 pl., 4 figs., 3 tabs.

A detailed report on the gross and microscopic anatomy of *Hydrolagus collicii*.

1953.—Stingray attacks and their treatment. *Amer. Jour. Trop. Med. Hyg.*, 2 (1): 115-128, 12 figs.

A general résumé of the anatomy of stingrays as it relates to their stinging ability. Clinical characteristics and treatment of stingray attacks are discussed.

HALSTEAD, B. W., L. S. KUNINOBU and H. B. HEBARD.

1953.—Catfish stings and the venom apparatus of the Mexican catfish, *Galeichthys felis* (Linnaeus). *Trans. Amer. Micr. Soc.*, 72 (4): 297-314, 6 figs.

An exhaustive study on catfish stings and the anatomy of the venom organs of catfishes.

HALSTEAD, B. W., and F. R. MODGLIN.

1950.—A preliminary report on the venom apparatus of the bat-ray, *Holorhinus californicus*. *Copeia*, (3): 165-175, 6 figs.

A study of the gross and microscopic anatomy of the venom organ of *Holorhinus californicus*.

HARMON, R. W., and C. B. POLLARD.

1948.—Bibliography of animal venoms. University of Florida Press, Gainesville, Florida: 1-340.

A chronological bibliography covering the years 1875 to 1946. References to venomous fishes are scattered throughout. A valuable work.

HEWITT, G. H.

1943.—The treatment of bullrout lesions. *Med. Jour. Australia*, 2 (December 11): 491-492.

Treatment with novocain.

HOLLOWAY, J. E., N. C. BUNKER and B. W. HALSTEAD.

1953.—The venom of *Urobatis halleri* (Cooper), the round stingray. *Calif. Fish and Game*, 39 (1): 77-82, 1 fig., 2 tabs.

The venom of the round stingray is found to be concentrated in the epithelium lining the ventrolateral-glandular grooves of the sting. Experiments indicating this are described and results tabulated.

JORG, M. E.

1939.—Ulcera cutánea gangrenosa por herida com espina caudal de pez raya. (Histologia del apéndice caudal de *Potamotrygon* sp.) *Novena Reunión Sec. Argent. Patol. Reg.*, 3:1599-1616, 11 figs.—*vide Zool. Record* 1940 (1941), Pisces, p. 11.

KESTEVEN, L.

1914.—The venom of the fish *Notesthes robusta*. *Proc. Linnean Soc. New South Wales*, 39 (1): 91-92.

A report on the clinical characteristics of a wound from *Notesthes robusta*, the bullrout. The author concludes that the sting is undoubtedly venomous.

LABILLARDIÈRE, J. J.

1800.—Voyage in search of La Perouse. (English ed.) 2: 253.

Seaman pricked by *Scorpaena digitata* in New Caledonia.

LIGGINS, J. B.

1939.—An unusual bathing fatality. *New Zealand Med. Jour.*, 38: 27-29.

A clinical report of the internal and external injuries to a girl whose heart was pierced by a stingray's sting.

McCULLOCH, A. R.

1925.—Stone fishes and the art of camouflage. *Australian Mus. Mag.*, 2: 159-162, 3 figs.

Popular article

MYLREA, C. S. G.

1923-24.—A note on the treatment of scorpion sting and the sting of venomous fishes in Arabia. *Trans. Roy. Soc. Trop. Med. Hyg.*, 17: 210-211.

The author advocates novocaine and adrenalin for the sting of scorpions and venomous fishes.

OCAMPO, R. R., B. W. HALSTEAD and F. R. MODGLIN.

1953.—The microscopic anatomy of the caudal appendage of the spotted eagleray, *Aetobatus narinari* (Euphrasen), with special reference to the venom apparatus. *Anat. Rec.*, 115 (1): 87-99, 9 figs.

A detailed histological study of the caudal appendage and venom apparatus of the stingray *Aetobatus narinari*. Recommendations are made regarding the terminology concerned with the anatomy of stingray venom organs.

Ogilby, J. D.

1893.—Edible fishes and crustaceans of New South Wales. Govt. Printer, Sydney: 68.

Bullrout sting.

1903.—Studies in the ichthyology of Queensland. *Proc. Roy. Soc. Queensland*, 18: 7-27.

A taxonomic report on the genus *Centropogon*. The author is of the opinion that *Notesthes robusta* is not venomous.

PARADICE, W. E. J.

1924.—Injuries and lesions caused by the bites of animals and insects. *Med. Jour. Australia*: 650-652, 2 figs.

Brief reports are made of the following cases: bites by eels, Chinaman fish poisoning, pricks from worms and gill rakers of fish, stabs from the spine of *Squalus megalops*, stings from sea urchins and from *Plotosus megastomus* and from *Urolophus testaceus*, poisoning from *Tetrodon*, rash from larval ticks, cuts from coral, and burning from jellyfish slime in the eye.

PAWLOWSKY, E. N.

1907.—On the anatomy of the epidermis and its glands in venomous fish. (Text in Russian.) *Trav. Soc. Imp. Natur. St. Petersbourg*, 38 (1): 265-282.

A histological study of the epidermis and skin glands in venomous fish. Species of the following genera were studied: *Trachinus*, *Scorpaena*, *Batrachus*, *Doras*, *Trygon*, and *Lepidogaster*.

1909.—On the question of the (poisonous) skin glands of certain fishes. (Text in Russian.) *Trav. Soc. Imp. Natur. St. Petersbourg*, 40 (1): 109-126, 5 figs.

This article appeared in German as follows:

1909.—Ein Beitrag zur Kenntniss der Hautdrüsen (Giftdrüsen) einiger Fische. *Anat. Anz.*, 34 (13-14): 314-330, 6 figs.

A histological study of the skin glands (and venom apparatus) of such venomous fish as *Sebastes*, *Pelor*, *Acanthurus*, *Blepsias* (Cottidae), and *Muraena*. Reference is also made to studies on *Scorpaena*, *Trachinus*, *Trygon*, *Pterois*, and others.

1911.—On the question of the structure of the poison glands of some fishes of the family Scorpaenidae. (Text in Russian.) *Trav. Soc. Imp. Natur. St. Petersbourg*, 41 (1): 317-328.

This article appeared in German as follows:

1911.—Ein Beitrag zur Kenntniss des Baues der Giftdrüsen einiger Scorpaeniden. *Zool. Jahrb.*, 31: 529-542.

A histological study of the venom glands of *Synanceia erosa*, *Pterois lunulata*, and *Scorpaena fimbriata*. Other venomous fishes which have been studied are named, and some general information is included.

1914.—Über den Bau der Giftdrüsen bei *Plotosus* und anderen Fischen. *Zool. Jahrb.*, 38: 427-442, 3 pls., 4 figs.

A detailed discussion of the histology of the venom organs of *Apistus*, *Paracentropogon*, *Pterois*, *Siganus*, and *Plotosus*.

PHISALIX, M.

1931.—Le venin de quelques poissons marins. *Notes, Station Océanogr. Salammbô*, No. 22: 3-15.

A report on the toxicity of the venom of *Trachinus draco*, *Scorpaena porcus*, *Trygon pastinaca*, the bite of *Muraena helena*, and the serum of *M. helena*. Venom apparatus of each is anatomically described and experimental data are included.

RALPH, C. C.

- 1943.—Poison of the stone-fish. *Vict. Naturalist*, 60: 77.
New Guinea stonefish venom.

REED, H. D.

- 1907.—The poison glands of *Noturus* and *Schilbeodes*. *Amer. Naturalist*, 41: 553-566, 5 figs.

A detailed histological study on the venom apparatus of *Noturus* and *Schilbeodes*. An important anatomical work.

- 1924.—The morphology of the dermal glands in Nematognathous fishes. *Zschr. Morph. Anthropol.*, 24: 227-264, 32 figs.

A report on the dermal glands of catfishes with reference to their venom organs. An important paper.

RONKA, E. K., and W. F. ROE.

- 1945.—Cardiac wound caused by the spine of the stingray (suborder Masticura). *Mil. Surg.*, 97: 135-137.

A clinical report on a victim who received a cardiac puncture from a stingray.

RUSSELL, F. E.

- 1953.—Stingray injuries: a review and discussion of their treatment. *Amer. Journ. Med. Sci.*, 226: 611-622, figs. 1-3.

- 1954.—The Stingray. *Engineering & Science Monthly*. Pasadena, Calif. January: 15-18, 6 figs.

Many "attacks" in California and other countries, including Australia. Effects of venom.

SACCHI, M.

- 1895.—Sulla struttura degli organi del veleno della Scorpena. *Boll. Mus. Zool., Genova*, (30): 1-10; (36): 1-4, 1 pl.

Excellent descriptions of the venom organs of *Scorpaena*.

SAVILLE-KENT, W.

- 1893.—The Great Barrier Reef of Australia. Allen and Co., London: 286, pl. 47, fig. 1.
Brief reference is made to the venomous properties of the stonefish.

SCHNEE, S.

- 1908.—Vorläufige Mitteilungen über eine beobachtete Vergiftung durch den Feuerfisch (*Pterois*). *Arch. Schiffss. Tropenhyg.*, 12: 166-167.

A report on the treatment for a wound from *Pterois*, with comments on the appearance of the fish. The paper is of minor importance.

SMITH, J. L. B.

- 1951.—A case of poisoning by the stonefish, *Synanceja verrucosa*. *Copeia*, (3): 207-210.
Personal experience of a wound from *Synanceja verrucosa* is related. An excellent case report.

TASCHENBERG, E. O.

- 1909.—Die giftigen Tiere. Stuttgart: 174-194 (figs. 34-41), 253-267 (figs. 60-62), and 293-297.

A fairly complete record is made of poisonous and venomous fishes, with comments on the habitat, appearance and toxic effects of many.

VELLARD, J.

- 1931.—Venin des raies (*Taeniura*) du Rio Araguaya (Brésil). *Compt. rend. Acad. Sci., Paris*, 192: 1279-1281.

Experiments are described to show the physiological reactions of various animals to the venom of *Taeniura dumerilii* and *T. mülleri*. An important paper.

WALLACE, L. B.

- 1893.—The structure and development of the axillary gland of *Batrachus*. *Jour. Morph.*, 8: 563-568, 1 pl.

Histological study of *Batrachus* glands as described, showed three sets of glands near the pectoral fin. The nature of the secretion was not determined.

WHITLEY, G. P.

- 1932.—Fishes. Great Barrier Reef Exped. 1928-29, *Sci. Rept.*, 4 (9): 306-310, pl. 4, figs. 1-2.

A taxonomic description of *Synanceja trachymis* with a reference to the venom organ.

- 1943.—Venomous fishes. *Fisheries News Letter*, 2 (1): 7-8.

Popular account.

WHITLEY, G. P., and W. BOARDMAN.

- 1929.—Quaint Creatures of a Coral Isle. *Australian Mus. Mag.*, 3 (11): 366-374, 13 figs.
Synanceja horrida is mentioned as being deadly. A case of poisoning from one of its spines is included.

WRIGHT-SMITH, R. J.

- 1945.—A case of fatal stabbing by a stingray. *Med. Jour. Australia*, 2: 466-467, 2 figs.
 A clinical account of a fatal stingray attack, including autopsy report and general data about stingrays.

WUTH, E. M.

- 1877.—On fish-poison. *Australian Med. Jour.*, 22: 273-276.

A medical account of a wound received from a stingray and the author's treatment for it. Some general observations are also made on jellyfish and mussel poisoning.

ZAHN, C.

- 1943.—The Rattlesnake of the Sea. *Natural History* (New York), 51, 2. February: 100-101.
 Stingray, *Urobatis halleri*.

ADDENDA

As this Bibliography was in the course of publication the following papers were received in Sydney: the first two dealing with poisonous fishes, and the third with venomous fishes.

CLARK, E., and H. A. F. GOHAR.

- 1953.—The fishes of the Red Sea: Order Plectognathi. *Publ. Mar. Biol. Stat. Al Ghardaqa* (Red Sea), 8: 1-80, pls. 1-5.

Poisonous properties of blowfishes and method of preparing them for food. Regional variation in poison of *Lagocephalus sceleratus* with fatal cases of poisoning at Giemsa, Red Sea.

HALSTEAD, B. W., and N. C. BUNKER.

- 1954.—A survey of the poisonous fishes of Johnston Island. *Zoologica* 39, 2: 61-77, fig. 1 (map).

Extracts of various parts of 206 fishes, representing 60 species, tested on white mice. About 75 per cent. were found to be toxic: 64 per cent. of those tested had toxic musculature and about 98 per cent. of the poisonous fishes had toxic viscera.

RUSSELL, F. E., and A. VAN HARREFELD.

- 1954.—Cardiovascular effects of the venom of the Round Stingray, *Urobatis halleri*. *Arch. internat. Physiol.*, 62: 322-333, figs. 1-6.

Observations on vasodilatation and vasoconstriction. The venom has a direct effect on the heart.