

DANIEL BRANCH QUAYLE (1913-1993)

Marine Biological Laboratory/ Woods Hole Oceanographic Institution

JUL 2 9 1994

Daniel (Dan) Branch Quayle, a recognized world authority in the field of molluscan biology and bivalve culture, passed away October 19, 1993, at his home in Nanaimo, British Columbia. He was 80 years old.

Dan was born in the U.K. in 1913 but the family emigrated to Canada when he was three years old and settled in Ladysmith, British Columbia, where his father worked in the local coal mines. Dan received his elementary and secondary education in Ladysmith. He undoubtedly developed his love for the marine environment at an early age as he played around the shores of Ladysmith Harbour. One note in his C.V. includes the notation, "1929—coal miner (stimulus to Academe)."

In 1929 Dan attended the Provincial Normal School in Victoria, British Columbia, graduating as a teacher in 1930. He taught for three years, 1930-34, in the Michel-Natal area in southeastern British Columbia. He continued to maintain a love of young people and teaching for the rest of his life.

His love of the sea brought him back to the coast and in 1934 he returned to Vancouver where he enrolled in the University of British Columbia receiving his B.A. degree in Zoology in 1937. During this period he worked as a summer student under the direction of Dr. C. R. Elsey and began his life-long interest and association with oysters. In 1936 Dan assisted Dr. Elsey with studies of Pacific oyster, Crassostrea gigas, breeding in Ladysmith Harbour. A large general breeding occurred in Ladysmith Harbour that year and in 1937, Dr. Elsey and Dan took juveniles from this set and planted them in isolated inlets along the west coast of Vancouver Island. Offspring from these plantings still remain in these inlets. Dan undertook his M.A. degree in Zoology under Dr. MacLean-Fraser at U.B.C., receiving his degree in 1938.

In 1938 he joined the staff of the Fisheries Research Board of Canada at the Pacific Biological Station in Nanaimo. This was the beginning of his life-long association with this Station that spanned a period of 55 years. He assumed responsibility for the molluscan research program and began an investigation of molluscan shellfish resources in the Province. Although his work focused on molluscan resources that could support commercial fisheries he began studies of the invertebrate fauna and ecology of marine invertebrates that would continue for the rest of his life.

In 1941 he joined the Royal Canadian Air Force and became a navigator in an elite pathfinder squadron. He was shot down over Germany and was a prisoner of war for 1.5 years.

At the end of the Second World War in 1945 he returned for a brief period to the Pacific Biological Station, assuming responsibility for the molluscan shellfish research program. He left shortly after to undertake his PhD degree at the University of Glasgow under the direction of Sir C. M. Yonge, receiving his degree in 1948.

After receiving his PhD degree, Dan returned to British Columbia but went to work for the British Columbia Provincial Department

of Fisheries as Director of Biological Services. He built a small laboratory at Ladysmith and commenced extensive studies on oysters and oyster culture in British Columbia. During this period he worked closely with industry, pioneering culture methods to improve oyster production. He continued to maintain a close association with people in the industry, not only in British Columbia but elsewhere, for the rest of his life.

From 1956-1957, Dan was Director of Fisheries for the Province of British Columbia.

In 1957 Dan left the Provincial government and British Columbia and went to the United States where he worked from 1957–1958 as a technical advisor to the Coast Oyster Company in South Bend, Washington and then as a Technical Advisor to a Chesapeake Bay oyster consortium in Virginia.

In 1958 he returned to the Pacific Biological Station and continued his lifetime study of the ecology of marine invertebrates of British Columbia until his retirement in March 1973. During this period he undertook extensive research on marine invertebrate populations along the coast and became recognized as a world authority in the field. He maintained a keen interest in a wide range of marine invertebrate subjects and published numerous scientific and semi scientific papers. Dan's close association with the industry continued and during this period he published his book, "Pacific Oyster Culture in British Columbia", which became a standard text for oyster culture, particularly for the west coast of North America. Much of the success of the British Columbia oyster industry is due to the efforts of Dan Quayle.

After his retirement in 1973, Dan became a consultant for Canadian Overseas Aid organizations; Canadian International Development Agency (CIDA), International Development Research Centre (IDRC), and Canadian Executive Services Overseas (CESO). This work took him to developing countries throughout the world where he assisted in the development of shellfish culture industries. Results of this work resulted in various publications which served as texts for bivalve culture in developing countries. He also taught courses on oyster culture at Dalhousie University in Halifax, Nova Scotia.

When not involved in overseas consulting, Dan continued as an active volunteer research worker at the Pacific Biological Station from the time of his retirement until shortly before his death. When he was in Nanaimo he was at the Station almost daily. He continued with studies of marine invertebrates and in particular on molluscs and bivalve culture and published widely. He undertook a major revision of his "Pacific Oyster Culture in British Columbia" publication which appeared in 1988. Shortly before his death he completed a major work on Wood Borers in British Columbia. He was an inspiration to the staff of the Pacific Biological Station and was highly respected for his never ending quest for knowledge. Dan was a kind and patient person and always had time to talk with younger staff members and give them the benefit of his long years of experience.

Three marine invertebrates were named in honour of Dan. The shrimp, Quayle's spinytail, Systellaspis braueri, a hermit crab, Pagarus quaylei and a bivalve, Lyonsiella quaylei.

In 1989 the University of Victoria awarded him an honourary LLD degree in recognition of his work in the field of marine invertebrates and molluscan culture in British Columbia and throughout the world.

Dan was always interested in athletics. During his University days he was a member of the U.B.C. soccer team and a member of the University of Glasgow basketball team. He was a keen golfer and a regular member of a Saturday morning golf group from the Pacific Biological Station.

Dan was a long time member of the National Shellfisheries Association. He served on the Editorial Board for the Proceedings and the Journal for many years and was active in the west coast section of the Association. He was made an Honorary Member of the Association in 1973 and awarded the Wallace Award in 1992.

Dan was a wonderful field and ship-board companion. Those of us who were privileged to travel with him will remember the close companionship and long philosophical discussions we had on a wide variety of biological and other topics. They were stimulating to all of us who accompanied Dan on trips and have done much to assist and direct us in our work.

Dan is survived by his wife Ann, his daughter Moura and by a host of friends whose lives have been enriched by their association with him.

Neil Bourne Pacific Biological Station Nanaimo, British Columbia CANADA V9R5K6

## Partial Publication List for D. B. Quayle

Quayle, D. B. 1938. Paphia bifurcata, a new molluscan species from Ladysmith Harbour, B.C. J. Fish. Res. Bd. Can. 4(1):53-54.

Elsey, C. R. & D. B. Quayle. 1939. Distribution of oyster larvae from the 1936 spawning in Ladysmith Harbour. Pac. Prog. Rep. 40:8-10.

Quayle, D. B. 1939. The British Columbia clam problem. Pac. Prog. Rep. 39:19-20.

Quayle, D. B. 1940. A preliminary report on the British Columbia clam investigation. Rep. B.C. Dep. Fish. 1939:67-17.

Quayle, D. B. 1940. Japanese oyster propagation. Pac. Prog. Rep. 43:8-9.

Quayle, D. B. 1940. How to identify some common British Columbia clams. Pac. Prog. Rep. 46:6-11.

Quayle, D. B. 1941. The edible molluscs of British Columbia. Rep. B.D. Dep. Fish. 1940:J75-J87.

Quayle, D. B. 1941. The Japanese "Little neck" clam accidently introduced into British Columbia water. Pac. Prog. Rep. 48:17-18.

Quayle, D. B. 1941. Some natural enemies of the clam in British Columbia. Pac. Prog. Rep. 50:21-22.

Quayle, D. B. 1942. The use of dynamite in teredo control. Pac. Prog. Rep. 51:20.

Quayle, D. B. 1943. Sex, gonad development and seasonal gonad changes in Paphia staminea Conrad. J. Fish. Res. Bd. Can. 6(2):140-151.

Quayle, D. B. 1946. How frequently should butter clams be dug? Pac. Prog. Rep. 69:63-65.

Hart, J. L., F. Neave & D. B. Quayle. 1949. The Fishery Wealth of British Columbia. Tran. 2nd Resources Conf. 87-128.

Quayle, D. B. 1949. Movements in Venerupis (Paphia) pullastra (Montagu). Proc. Malac. Soc. London. 28(1):31-37.

Quayle, D. B. 1949-1957. Oyster bulletins. B.C. Dep. Fish. Shellfish Lab. Ladysmith, B.C. 1-8. 65 numbers. 391 pp.

Foerster, R. E., N. M. Carter, C. R. Elsey, W. S. Hoar & D. B. Quayle. 1950. Resource-use problems in British Columbia fisheries. B.C. 3rd Nat. Res. Conf. pp. 102-129.

Hart, J. L., F. Neave & D. B. Quayle. 1951. Brief on the fishery wealth of British Columbia. Fish. Res. Bd. Can. MS Rep. Biol. 425. 35 p.

Quayle, D. B. 1951. Structure of the larva and spat of Venerupis pullastra Montagu. Trans. Roy. Soc. Edinburgh. LXII, Pt. 1. 8. pp. 255-297.

Quayle, D. B. 1951. The seasonal growth of the Pacific oyster, Ostrea gigas in Ladysmith Harbour. Rep. B.C. Dep. Fish. 1950. 85-90.

Quayle, D. B. 1952. The relation of digging frequency to productivity of the butter clam, Saxidomus giganteus Deshayes. J. Fish. Res. Bd. Can. 8(5):369-373.

Quayle, D. B. 1952: The rate of growth of Venerupis pullastra (Montaguat Millport, Scotland. Proc. Roy. Soc. Edinburgh. Sect. B., 64. Pt. IV. pp. 384-406.

Quayle, D. B. 1952. The larva of Bankia setacea Tryon. Rep. B.C. Dep. Fish. 1951. 88-91.

Quayle, D. B. 1952. A report on the mortality of the shore invertebrates at Nanaimo, B. C. July, 1950. Fish. Res. Bd. Can. MS Rept. Biol. 416:3.

Quayle, D. B. 1953. The Pacific oyster of British Columbia. Dep. Fish. Can. Trade News. 5(8):3-5.

Quayle, D. B. 1955. Pacific oyster propagation in British Columbia. Pac. Prog. Rep. 102:2-22.

Quayle, D. B. 1956. Growth of the British Columbia shipworm. Pac. Prog. Rep. 105:3-5.

Quayle, D. B. 1956. The raft culture of the Pacific oyster in British Columbia. Pac. Prog. Rep. 107:7-10.

Quayle, D. B. 1956. The British Columbia shipworm. Rep. B.C. Dep. Fish. 1955:92-104.

Quayle, D. B. 1959. Freshwater kill of oysters, Crassostrea virginica in the James River, Virginia. Proc. Nat. Shellfisheries Ass. 49:29-49.

Quayle, D. B. 1959. Prediction of oyster setting in British Columbia, Crassostrea gigas. Proc. Nat. Shellfisheries Ass. 49:50-53.

Quayle, D. B. 1959. Pacific oyster seed production, Crassostrea gigas. Proc. Nat. Shellfisheries Ass. 49:54-58.

Quayle, D. B. 1959. The growth rate of *Bankia setacea* Tryon. In: Marine boring and fouling organisms (1st Friday Harbor Symposium). Univ. Washington Press, Seattle. pp. 175–183.

Quayle, D. B. 1959. The early development of *Bankia setacea* Tryon. In: Marine boring and fouling organisms (1st Friday Harbor Symposium). Univ. Washington Press, Seattle. p. 157–174.

Quayle, D. B. 1960. The intertidal bivalves of British Columbia. B.C. Prov. Mus. Handb. 17:104 p.

Quayle, D. B. 1961. Denman Island oyster disease and mortality, 1960. Fish Res. Bd. Can. MS Rep. Biol. 713:9 p.

Quayle, D. B. 1961. Deep water clam and scallop survey in British Columbia. Fish. Res. Bd. Can. MS Rep. Biol. 717:80 p.

Quayle, D. B. 1962. Deep water clam and scallop survey in British Columbia. Fish. Res. Bd. Can. MS Rep. Biol. 746:38 p.

Quayle, D. B. 1962. Abalones in British Columbia. Pacific Prog. Rep. 114:9-12.

Quayle, D. B. 1962. The Pacific razor clam. Dep. Fish. Can. Trade News. 14(9):8-9.

Quayle, D. B. 1963. (With a statistical appendix by W. E. Ricker). Mortality in Pacific oyster seed. Proc. Nat. Shellfisheries Ass. 52:52-63.

Smith, M. & D. B. Quayle. 1963. Deoxyribonucleic acids of marine mollusca. Nature 200(4907):676.

Quayle, D. B. 1964. Distribution of introduced marine Mollusca in British Columbia waters. J. Fish. Res. Bd. Can. 21(5):1155-1181.

Quayle, D. B. 1964. Dispersal of introduced marine wood borers in British Columbia waters. Comptes Rendus du Congres International de la Corrosion Marine et des Salissures. Cannes, France. pp. 409-417.

Quayle, D. B. 1964. Marine borers in B.C. coastal waters. In: Symposium on wooden marine pilings. Can. Dep. Forestry Pub. 1044:1-10.

Quayle, D. B. 1964. The effect of kraft mill effluent on the Pacific oyster, Crassostrea gigas, with particular reference to Crofton, B.C. Fish. Res. Bd. Can. MS Rep. Biol. 765:32.

Quayle, D. B. 1965. Seasonal and geographic distribution of toxins in British Columbia clams. Proc. Join Sanitation Seminar on North Pacific Clams, Sept. 24–25, Juneau, Alaska. p. 7–8.

Quayle, D. B. 1965. Animal detoxification. Proc. Joint Sanitation Seminar on North Pacific clams. Sept. 24–25, Juneau, Alaska. pp. 11–12.

Quayle, D. B. Marine borers introduced into British Columbia. Fish. Res. Bd. Can. MS Rep. Biol. 837:31.

Quayle, D. B. 1966. Paralytic shellfish poisoning—safe shellfish. Fish. Res. Bd. Can. Nanaimo, Biol. Stn. Circ. 75:11.

Quayle, D. B. 1966. Marine borers in British Columbia coastal waters. In: Symposium II on wooden marine pilings. Can. Dep. Forestry and Rural Development. Information Rep VP-X-9. pp. 1–28.

Quayle, D. B. & F. Bernard. 1966. Shellfish toxicity records, 1942-1965. Fish. Res. Bd. Can. MS Rep. Biol. 860:210.

Quayle, D. B. & L. D. B. Terhune. 1966. The hydrodynamics and field trial results of a perforated pipe plankton sampler. Fish. Res. Bd. Can. MS Rep. Biol. 887:31.

Bernard, F. R., N. Bourne & D. B. Quayle. 1967. British Columbia faunistic survey. A summary of dredging activities in Western Canada, 1878-1966. Fish. Res. Bd. Can. MS Rep. 920:61.

Quayle, D. B. 1967. Canning toxic butter clams, Saxidomus giganteus. Fish. Res. Bd. Can. MS Rep. 936:8.

Quayle, D. B., J. Flury, B. Ackerman & F. Vernard. 1967. A portable recompression chamber for treatment of victims of diving accidents. J. Fish. Res. Bd. Can. 24(12):2637–2638.

Quayle, D. B. & L. D. B. Terhune. 1967. A plankton sampler for oyster larvae. J. Fish. Res. Bd. Can. 24(4):883-885.

Tynen, M. J. & D. B. Quayle. 1967. Breeding of the Pacific oyster in Pendrell Sound, 1966. Fish. Res. Bd. Can. MS Rep. 919:33.

Bernard, F. R., N. Bourne & D. B. Quayle. 1968. British Columbia faunistic survey. A summary of dredging activities, 1966–1967. Fish. Res. Bd. Can. MS Rep. 975:12.

Quayle, D. B. & F. R. Bernard, 1968. Oyster purification study. 1. Incidence and enumeration of coliform bacteria in the Pacific oyster. Fish. Res. Bd. Can. MS Rep. 973:21.

Quayle, D. B. & M. J. Tynen. 1968. The breeding of the Pacific oyster in British Columbia in 1967. Fish. Res. Bd. Can. MS Rep. 978:26.

Quayle, D. B. 1969. Paralytic shellfishing poisoning in British Columbia. Fish. Res. Bd. Can. Bull. 168:68.

Quayle, D. B. 1969. Pacific oyster culture in British Columbia. Fish. Res. Bd. Can. Bull. 169:192.

Bernard, F. R., N. Bourne & D. B. Quayle. 1970. British Columbia faunistic survey. A summary of dredging activities, 1967–1969. Fish. Res. Bd. Can. MS Rep. 1082:7.

Bourne, N. & D. B. Quayle. 1970. Breeding and growth of razor clams in British Columbia. Fish. Res. Bd. Can. Tech. Rep. 232:42.

Quayle, D. B. 1970. The shore fauna of Coffin Island, B.C. Fish. Res. Bd. Can. MS Rep. 1122:46.

Quayle, D. B. 1971. Pacific oyster raft culture in British Columbia. Fish. Res. Bd. Can. Bull. 178:34.

Quayle, D. B. 1971. Growth, morphometry and breeding in the British Columbia abalone, *Haliotis kamtschatkana*. *Jonas*. *Fish*. *Res*. *Bd*. *Can*. *Tech*. *Rep*. 279:84.

Brett, J. R., J. R. Calaprice, R. J. Ghelardi, W. A. Kennedy, D. B. Quayle & C. T. Shoop. 1971. A brief on mariculture. Fish. Res. Bd. Can. Tech. Rep. 301:46.

Lewis, J. R. and D. B. Quayle. 1972. Some aspects of the littoral ecology of British Columbia. Fish. Res. Bd. Can. MS Rep. 1213:23.

Quayle, D. B. & N. Bourne. 1972. The clam fisheries of British Columbia. Fish. Res. Bd. Can. Bull. 179:70.

Quayle, D. B. 1973. Possibilidades para o cultivo de ostras em algumas areas estuarinas do Estado do Ceara (Brasil). Laboratorio de Ciencias do Mar, Universidade Federal do Ceara, Fortaleza, Brasil. 12 pp.

Bernard, F. R. & D. B. Quayle. 1973. British Columbia faunistic survey, a summary of dredging activities, 1970–1972. Fish. Res. Bd. Can. MS Rep. 1240:11.

Quayle, D. B. 1974. The Vanlene oil spill. Fish. Res. Bd. Can. MS Rep. 1289:21.

Quayle, D. B. 1974. Pendrell Sound oyster breeding 1950-1970. Fish. Res. Bd. Can. MD Rep. (Data Rep). 389.

Quayle, D. B. 1974. Variance in marine borer attack in connection with a treated wooden pile experiment at Crofton, B.C. Fish. Res. Bd. Can. MS Rep. 1297:15.

Quayle, D. B. 1975. Tropical oyster culture; a selected bibliography. International Development Research Centre, Ottawa. IDRC-052e. pp. 1-40.

Quayle, D. B. and D. W. Smith. 1976. A guide to oyster farming. B.C. Marine Resources Branch. Dep. Recreation and Travel Industry, Victoria, B.C. 54 pp.

Quayle, D. B. & F. R. Bernard. 1977. Purification of basket-held Pacific oysters in the natural environment. Proc. Nat. Shellfisheries Ass.

Quayle, D. B. 1980. Tropical oyster culture; culture and methods. International Development Research Centre, Ottawa. IDRC-TS17e. 80.

Quayle, D. B. 1988. Pacific oyster culture in British Columbia. Can. Fish. Aquatic Sci. Bull. 218:241.

Quayle, D. B. 1988. Natural molluscan seed production. In: Production de larvas y juveniles de espedies marinas (E. Uribe, Ed). Universidad del Norte, Sede Coquimbo, Chile p 45–50.

Quayle, D. B. and G. F. Newkirk. 1989. Farming bivalve molluscs: methods for study and development. Advances in World Aquaculture, I. World Aquaculture Society. 294 pp.

Quayle, D. B. 1992. Marine wood borers in British Columbia. Can. Special Pub. Fish and Aquatic Sci. 115:55.

Quayle, D. B. 1992. Tidelines: an abridged edition authorized by the British Columbia Research Corporation. Can. Tech. Rep. Fish. Aquatic Sci. 1902:136.

Quayle, D. B. 1993. Some British Columbia bivalve larvae. Private Publ. 42.