

Chapter 7

Bioarchaeology in Canada: Origins and Contemporary Issues

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The Origins of “Bioarchaeology” in Canada

Bioarchaeology in Canada has its roots in physical anthropology, a discipline whose intellectual history in the country can be traced to the middle of the nineteenth century (Melbye and Meiklejohn 1992; Popham 1950). It was not until much later and mainly during the 1960s, however, that the study of human skeletal remains from archaeological sites truly began a sustained scholarly journey to its modern emphasis on biological distance analysis, palaeodemography, palaeopathology, palaeodietary studies, and, most recently, ancient DNA research, all within the context of archaeological (i.e. social, cultural, and environmental) theory.

Initially and throughout its formative years, two institutions were largely responsible for the development of physical anthropology and bioarchaeology, the University of Toronto (Sawchuk and Pfeiffer 2001), and the National Museum of Canada (now the Canadian Museum of Civilization), both situated in central Canada. They continue their prominence today, but bioarchaeology is now researched and taught at many institutions of higher learning across the whole of the country—from Memorial University in St. Johns, Newfoundland on the east coast to the University of Victoria in British Columbia on the west, a driving distance of 7,000 km. In addition to the study of ancient aboriginal remains (Indian or First Nations and Inuit), an initial and subsequent mainstay of bioarchaeology in

This chapter is dedicated to the memory of Dr. Shelley Rae Saunders (1950–2008), who was originally invited to speak about Canadian Bioarchaeology at the 2008 SAA symposium in Vancouver and contributed to the information presented here.

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Canada, researchers have addressed historical and theoretical issues involving study of the remains of early European settlers and military personnel in Canada, nineteenth century townfolk, and Arctic explorers. Today, Canadian researchers contribute their expertise and exchange interests throughout the world.

The Early Years (1848–1958)

During the first approximately 100 years of physical anthropology in Canada, there were few published works, no developing academic programs, and certainly no student legacy. Yet, there were some key developments, if not necessarily milestones, that likely had some influence on the significant 1960s.

The early practitioners of physical anthropology in Canada were mainly natives of England and Scotland and received their educations there. Their backgrounds were largely in medicine. Popham (1950: 175) writes that the earliest contribution was a work on the physical characteristics of the Inuit (then known as Eskimo or Esquimaux) by King (1848) in which he also remarked upon skulls. Dr. Richard King (1810–1876) was a British obstetrician and explorer who appears to have made one trip to the Canadian Arctic where he observed his living subjects first hand (Wallace 1987).

Sir Daniel Wilson (1816–1892), born in Scotland, is another pioneer. He emigrated to Canada and was well versed in archaeology before he left his native land (Meiklejohn 1997). He took up a chair in History and English Literature at the University of Toronto and eventually became its president. Wilson's contributions to human osteology were principally in cranial studies and theory. He published a treatise on the skulls of Huron Indians, an Iroquoian group in the province of Ontario (Wilson 1871), and became known in North American anthropological circles for his critical stance on Samuel Morton's approach to cranial types and the races of man. Most notably, Wilson questioned Morton's supposition that American Indian crania lacked diversity (Stewart and Newman 1951).

Susanna Boyle (1869–1947) has been promoted as Canada's first female physical anthropologist (Cook and Horne 2006). She was born in Ontario to David Boyle (1842–1911), a Scottish immigrant who became curator of the Canadian Institute Museum and later the Ontario Provincial Museum, forerunner of the Royal Ontario Museum in Toronto. David Boyle published on archaeological sites in Ontario and built up human skeletal collections, while his daughter, a medical doctor, wrote up the human remains as appendices to his reports (Anderson 1962a; Boyle 1892).

The German–American anthropologist, Franz Boas (1858–1942), studied the physical anthropology of the native peoples of the Pacific Northwest in the 1890s. Most of those observations came from Canada's west coast and interior plateau. His collections on behalf of the Jessup North Pacific Expedition of the American Museum of Natural History led to publications on craniology (Oettinger 1930),

intentional head shape modification for which native Northwest Coast people are historically well known (Boas 1889, 1891: 647–655; Cybulski 1975a), and occasional references to pathological specimens (Boas 1890: 811). The American anthropologist George Amos Dorsey (1868–1931) also published on the skeletal remains of Canada’s west coast Indians based on collections he and others made for the Field Columbian Museum (Field Museum of Natural History) in Chicago (Dorsey 1897a, b, c).

In the first decades of the twentieth century, the Federal Government of Canada funded a major scientific expedition to the Arctic under the direction of the Canadian explorer and ethnologist Vilhjálmur Stefánsson (1879–1962). The physical anthropology of the Inuit formed a significant part of the survey under the supervision of the ethnologist Diamond Jenness (1923) whose assignment was encouraged by the National Museum of Canada (Hancock 1999: 44–46). Dr. John Cameron (1873–1960), a professor of anatomy at Dalhousie University in Halifax (1915–1930), was responsible for the project’s study of human skeletal remains (Cameron 1923).

The National Museum of Canada played a leading role in the early years of human skeletal studies. Sir Francis Howe Seymour Knowles (1886–1953), a native of England, was hired in 1914 as the National Museum’s first physical anthropologist. He served only until 1919, when he returned to his home country due to ill health, but in those brief years studied living aboriginal people in Ontario as well as skeletal remains from archaeological sites. In addition to other works (Knowles 1915, 1916), a principal contribution was a comprehensive report on the “Roebuck Iroquois”, a collection of 84 human skeletons and assorted scattered remains found at a 500-year-old village site south of Ottawa, Ontario, near the St. Lawrence River (Knowles 1937). It may be considered as the first osteological site report in Canada with archaeological and anthropological context. Knowles’ monograph included demographic reconstruction, postcranial and cranial measurements, qualitative variables of continuous morphology, a few non-metric discontinuous traits, and skeletal and dental pathology, and drew specific comparisons with neighbouring skeletal samples from Ontario and New York State.

Other museum staff also contributed to the study of human remains, albeit on a smaller scale. They included Harlan Ingersoll Smith (1872–1940), an American archaeologist who formerly worked with Boas and the Jessup Expedition, and John Douglas Leechman (1890–1980), a native of England who was educated in London, Egypt, and Switzerland before coming to Canada as a youth (Dyck 1998). Both wrote on trephination in Northwest Coast aboriginal skulls (Smith 1924; Leechman 1944; see also Cybulski 1980, 2006: 538–539; Stewart 1958: 476–477), and Leechman (1934) described dental caries in the National Museum’s skeletal collections. Two practicing west coast physicians with an interest in anthropology, George Edward Kidd (1883–1948) and George Elias Darby (1889–1962), reported on teeth in archaeological skulls from the collections of the Vancouver City Museum in British Columbia (now the Museum of Vancouver) (Kidd and Darby 1933). Kidd also reported on apparent trepanation, osteoarthritis, and examples of artificial cranial deformation in those collections (Kidd 1930, 1946).

At the University of Toronto, a Canadian born professor of orthopaedics, Robert Inkerman Harris (1889–1966), published on the skeletal pathology of ancient aboriginal ossuaries in Ontario (Harris 1949; Kidd 1954). Perhaps the most influential historical figure on what would later become bioarchaeology in Canada was Dr. John Charles Boileau Grant (1886–1973), an anatomist and teacher *par excellence* (Tobias 1992). Born in Scotland where he obtained his medical degree, he first taught in Canada at the University of Manitoba and then at the University of Toronto as Professor and Head of the anatomy department between 1930 and 1956. He became world renown for producing three textbooks of anatomy that bear his name. One, *Grant's Atlas of Anatomy*, was first published in 1943 and is currently in its twelfth edition (Agur and Dalley 2009).

It has been said that Grant was a physical anthropologist in all but name (Jerkic 2001). During his teaching in Manitoba, he conducted research on the anthropometry of six different Canadian First Nations groups, all studies of which were published by the National Museum of Canada (Grant 1929, 1930, 1936). He also published on an Eskimo skeleton in the *American Journal of Physical Anthropology* (Grant 1922) and incorporated illustrations and frequency data on “skeletal variations and anomalies” (i.e. discrete traits) in his textbooks. Besides those books and his worldwide recognition, J.C.B. Grant left two lasting legacies. One was a research collection of the skeletal remains of 202 individuals of known age at death, sex, and cause of death acquired for the University of Toronto between 1928 and the 1950s (e.g. Bedford et al. 1993; Kurki 2005), and the other was a student by the name of James E. Anderson.

The 1960s and 1970s

Bioarchaeology as we know it today really began in Canada in the 1960s, following a path simultaneously underway in the USA (e.g. Buikstra and Beck 2006). First and foremost in its promotion was Dr. James Edward Anderson (1926–1995), Grant's student, who, unlike any of his historical predecessors in physical anthropology in Canada, became active internationally and left graduate students immersed in the discipline who, with their doctorates in hand, would reproduce others to carry on into the twenty-first century. He has been called the “father of Canadian skeletal biology” (Ellis et al. 2010: 2).

Dr. Anderson was a native-born Canadian who received a medical degree from the University of Toronto in 1953 and began teaching in the anatomy department in 1956. He also taught human osteology to pre-medical students in the anthropology department where he connected with Professor J. Norman Emerson (1917–1978), a faculty archaeologist who carried out local excavations and field schools in which Anderson became involved. Anderson was hired to the department's faculty in 1958 and became full professor in 1961, the first full-time teaching physical anthropologist in the country.

Anderson was a tireless champion of human skeletal studies in archaeology, a superior teacher, and an active researcher who gained international influence. Initially, he produced a series of publications on locally excavated skeletal remains and collections that detailed all aspects of skeletal studies then known, essentially taking Sir Francis Knowles' Roebuck Iroquois site report to the next level. The Ontario sites Anderson first studied and published included Bosomworth, Fairy, and Serpent Mounds (Anderson 1962b, 1964, 1968a). He combined his talents with Dr. James V. Wright (1932–2004), Ontario staff archaeologist at the National Museum of Canada, to produce reports on the Donaldson and Bennett sites in Ontario, assisting in the excavations and taking responsibility for the human osteology (Wright and Anderson 1963, 1969). Elsewhere in Canada he worked closely with Memorial University archaeologist Dr. James A. Tuck to produce comprehensive osteological studies on a Maritime Archaic period cemetery in Newfoundland (Anderson 1976) and on remains of the later Dorset Palaeoeskimos (Anderson and Tuck 1974). Also noteworthy was his collaboration with Canadian archaeologists James F. Pendergast (1921–2000) and Bruce G. Trigger (1937–2006) on the study of Montreal's Dawson site, speculatively identified as the Iroquoian village of Hochelaga visited by Jacques Cartier, the sixteenth century explorer who claimed Canada for France (Anderson 1972).

Anderson's international connections stemmed in part from a 3-year professorship (1963–1966) in the anthropology department of the State University of New York at Buffalo. While there teaching full time, he studied and wrote up the series of ancient human skeletons excavated in the Tehuacán Valley under the direction of Richard S. MacNeish (1918–2001), including an article in the journal *Science* (Anderson 1965, 1967). The series included the then oldest known group of skeletons in the Americas, 6500–5000 BC. Later, at the behest of the archaeologist Fred Wendorf at Southern Methodist University, he studied and reported on the skeletal remains of over 50 individuals from two Late Palaeolithic sites in Nubia, detailing vital statistics, metric and non-metric morphology, dental pathology, tooth wear, and skeletal pathology, and comparing the remains to others from Egypt, the Sudan, Northwest Africa and East Africa (Anderson 1968b).

Dr. Anderson was expert in the areas of palaeopathology and non-metric skeletal morphology and related theory. With the Tehuacán analysis, he identified patterns of change in dental pathology from the earliest to the latest skeletons that corresponded to cultural changes in subsistence (Anderson 1965). He served as a discussant in the landmark symposium on palaeopathology organized by Saul Jarcho and held in Washington, D.C. in 1965 to “reanimate” palaeopathology in the USA (Anderson 1966; Jarcho 1966). Anderson also identified changes in the frequencies of certain non-metric morphological variants (he dubbed them “anomalies”) which likely reflected genetic variation through time in the Middle Woodland, Late Woodland, and prehistoric Iroquois populations of Ontario (Anderson 1968a). He expanded this thesis in an invited contribution to Don R. Brothwell's book, *The Skeletal Biology of Earlier Human Populations*, which became required reading in many university bioarchaeology courses and remains so today (Anderson 1968c).

James Anderson returned to the anthropology department of the University of Toronto in 1966, bringing five graduate students with him from the University of Buffalo. He also took on others already there who had been orphaned by the untimely death of their mentor, Dr. Lawrence Oschinsky (1921–1965). Oschinsky, a native New Yorker, was hired by the department in 1963 when Anderson had left for Buffalo, following a 5-year staff position as Curator of Physical Anthropology at the National Museum of Canada (Swindler 1967). Well grounded and published in racial variation and evolutionary theory (Gaherty et al. 1969), he also left a lasting contribution for future skeletal biologists with his book, *The Most Ancient Eskimo* (Oschinsky 1964). It remains a master work on the cranial morphology of the Eskimo (Inuit) with special reference to the identification of Dorset skeletal remains in the eastern Canadian Arctic based on research he had conducted at the National Museum (see also Ossenberg 2001).

Anderson's return stay in Toronto was brief as he had already accepted a position in the medical school of McMaster University in Hamilton, Ontario, in 1967 which became full time in 1969. Effectively replacing him was Dr. David Rees Hughes (1926–2008) who had earlier worked as the National Museum of Canada's third physical anthropologist (1965–1967). While mainly involved with the International Biological Programme in Human Adaptability in the Canadian Arctic (Milan 1980), Hughes had also contributed to Brothwell's *The Skeletal Biology of Earlier Human Populations* and published on human remains from eastern Canada which he studied at the museum (Hughes 1968, 1969a, b). He also took to completion three of Anderson's Ph.D. candidates who went on to teach bioarchaeology in Canadian universities—Christopher Meiklejohn, Sonia Jerkic, and Patrick Hartney (1939–1980). In Canada, Anderson was responsible for the doctorates of four people in skeletal biology, three of whom continued bioarchaeology careers at Canadian institutions—Nancy S. Ossenberg, F. Jerome (Jerry) Melbye, and Jerome S. Cybulski. Robert I. Sundick went on to spread the word of James Anderson in the USA. Michael Pietrusewsky, who had come up with Anderson from Buffalo, studied with him at Toronto but was awarded his doctorate under Visiting Professor Dr. Bin Yamaguchi. Another of Canada's Anderson descendants was Michael W. Spence who gained BA and MA degrees under Anderson's and J. Norman Emerson's guidance at the University of Toronto (1959–1964) but went on to his Ph.D. at Southern Illinois University in the USA.

The 1970s introduced stability, academic expansion, and sustained growth to bioarchaeology in Canada. What would ultimately become long-term supporting research and (or) educational opportunity programs were instituted at Memorial University of Newfoundland (Dr. Sonja Jerkic), the National Museum of Canada (Dr. Jerome S. Cybulski), the University of Toronto (Dr. Jerry Melbye), Queen's University in Kingston, Ontario (Dr. Nancy S. Ossenberg), the University of Western Ontario (Dr. Michael W. Spence), the University of Winnipeg (Dr. Christopher Meiklejohn), and the University of Saskatchewan (Dr. Patrick C. Hartney [1939–1980]). Outsiders (mainly American-trained) or Canadians who

received their degrees elsewhere came to initiate human skeletal studies at the University of Manitoba (Dr. William D. Wade [1938–2012]), the University of Calgary (Dr. Charles E. Eyman [1933–1990]), the University of Alberta (Dr. D. Gentry Steele), Simon Fraser University (Dr. Thomas W. McKern [1920–1974]; Dr. Mark F. Skinner), the University of British Columbia (Dr. Braxton M. Alfred), and the University of Victoria (Dr. Roberta L. Hall).

Contemporary Issues

Academics

Today, there is a strong nationwide graduate teaching presence in bioarchaeology. Doctorates in physical anthropology with emphases in bioarchaeology are currently offered at the University of Toronto (Dr. Susan K. Pfeiffer, Dr. Michael A. Schillaci), the University of Montreal (Dr. Michelle Drapeau), McMaster University (Dr. Megan Brickley, Dr. Hendrik Poinar, Dr. Tracy L. Prowse), the University of Western Ontario (Dr. Andrew Nelson, Dr. Christine D. White, Dr. J. Eldon Molto), the University of Manitoba (Dr. Robert D. Hoppa), the University of Calgary (Dr. M. Anne Katzenberg), the University of Alberta (Dr. Nancy C. Lovell, Dr. Sandra J. Garvie-Lok), and Simon Fraser University (Dr. Mark F. Skinner, Dr. Dongya Yang, Dr. Mark Collard). The following institutions offer Master's degrees: Memorial University of Newfoundland (Dr. Sonja M. Jerkic, Dr. Vaughan Grimes), Trent University in Ontario (Dr. Anne Keenleyside and Dr. Jocelyn Williams), the University of British Columbia in Vancouver (Dr. Brian S. Chisholm, Dr. Michael P. Richards, Dr. Darlene A. Weston), the University of Northern British Columbia (Dr. Richard Lazenby), and the University of Victoria in British Columbia (Dr. Helen Kurki). Faculty in physical anthropology (aka bioanthropology) at three of the schools are in Departments of Archaeology, highlighting the symbiotic relationship between human skeletal studies and archaeology.

In 2000, the Government of Canada instituted countrywide recognition of excellence in university faculty research with its Canada Research Chairs program. It crosses all disciplines and generously supports faculty salaries and research funding for periods of seven or 5 years (Tier 1 and Tier 2, respectively). Recipients include the top echelon of teaching scientists. Dr. Shelley R. Saunders who taught in the anthropology department of McMaster University from 1981 to 2008 was the first recipient in bioarchaeology for studies in Human Disease and Population Relationships. Current holders include Dr. Christine D. White, University of Western Ontario, for research in bioarchaeology and isotopic anthropology, and Dr. Robert D. Hoppa, University of Manitoba, for research in skeletal biology. Of more than passing interest is that Dr. Saunders and Dr. White received their doctorates under the supervision of Dr. Jerry Melbye at the University of Toronto

and that Dr. Hoppa's doctorate was supervised by Dr. Saunders, all attesting to the quality of the scholarly gene pool initiated by Dr. James E. Anderson. A third current Canada Research Chair is Dr. Megan Brickley, a native of the UK who recently joined the faculty of McMaster University, for her research in the bioarchaeology of disease. Although not technically awarded in bioarchaeology, Dr. Mark Collard in the Department of Archaeology at Simon Fraser University holds a Canada Research Chair in a closely related field, Human Evolutionary Studies. His research portfolio includes the estimation of body mass, stature, and age from skeletal material.

On the federal level as well, the Canadian Museum of Civilization (formerly the National Museum of Canada, National Museum of Man) continues to support physical anthropological research either in-house or through external contracts and has maintained its long-standing publication program, begun with the work of Sir Francis Knowles. Since 1972, publications on human skeletal remains have been part of its monographic Mercury Series (e.g. Cybulski 1975a; Pfeiffer 1977; Saunders 1978; Merbs 1983; Molto 1983; Katzenberg 1984; Patterson 1984; Williamson and Pfeiffer 2003). As in the case of some university departments, as noted above, the Curator of Physical Anthropology and Physical Anthropology Programme are part of the museum's Archaeology and History Division, and formerly, the Archaeological Survey of Canada.

Ethics and Repatriation

Ethics and public perception in the study of human skeletal remains are current issues worldwide.¹ In Canada, the concern was already evident in the 1960s but very soon formally addressed by the Canadian Association for Physical Anthropology (CAPA). CAPA which, like the AAPA, or American Association of Physical Anthropologists in the USA, includes all subareas of physical anthropology was conceived in 1972 and held its first annual meeting in Banff, Alberta, in 1973. One of its first orders of business was to strike a committee to address the issue of proper procedure and public concern in the study of archaeological human remains. The result was a published set of guidelines on the excavation, treatment, analysis, and disposition of human skeletal remains from archaeological sites in Canada (Cybulski et al. 1979). Most importantly, the association encouraged understanding and cooperation on the part of archaeologists and physical anthropologists with First Nations and potential descendants from other groups in local community settings.

Members of CAPA had been exposed to cooperative and collaborative ventures with First Nations early in their graduate and professional careers. Shelley

¹ For more on the Canadian approach to these issues and how it contrasts with that of the USA, see Buikstra (2006, especially pp. 408–412).

Saunders worked on burial and skeletal material with the Ojibway Beausoleil Band on Christian Island in Georgian Bay, Ontario, late in the 1960s and early 1970s (Saunders et al. 1974). Jerome Cybulski, as a Master's level student at the University of Buffalo in 1965–1966, was fortunate to learn osteology within a cooperative field setting in south-western New York State measuring the bones of Seneca Indian ancestors who were being moved from soon to be flooded cemeteries near the banks of the Allegheny River (Lane and Sublett 1972; Saunders 2006: 191–193). This was one of many dam construction projects in the 1960s undertaken by the U.S. Army Corp of Engineers that impacted Native American burial grounds in the USA (see, for example, Sprague 2005). After completing his studies at the University of Toronto, Cybulski continued working with First Nations communities, first on burial recovery and in situ osteology at Hesquiat Harbour on the west coast of Vancouver Island (Cybulski 1978) and then at Owikeno Lake on the central mainland coast of British Columbia with the Oweekeno/Wuikinuxv Nation (Cybulski 1975b). Additional field and laboratory studies followed (Cybulski 1992; Cybulski et al. 2007).

Others, as well, have carried out cooperative First Nations projects involving bioarchaeology in Canada. In 1999, Kevin Brownlee and Leigh Syms (1999) published their *Kayasochi Kikawenow, Our Mother from Long Ago*, excavated from an eroding lakeshore in northern Manitoba and studied with the participation of the local Cree community. The following year saw publication by Owen Beattie and co-workers of the first research results on Canada's very own "iceman", Kwäday Dän Ts'inchii, a successful analytical and reburial collaboration among the British Columbia Archaeology Branch, the Royal British Columbia Museum, the University of British Columbia and the Champagne and Aishihik First Nations (Beattie et al. 2000). In 2003, Williamson and Pfeiffer (2003), the latter one of Jerry Melbye's doctoral recipients, published their *Bones of the Ancestors: The Archaeology and Osteobiography of the Moatfield Ossuary*, a project undertaken in collaboration with the Six Nations Council of the Grand River in Ontario.

While on-site or in situ osteology has provided a successful working compromise for continued studies in bioarchaeology, especially with respect to the remains of First Nations ancestors, it has not necessarily curtailed reburial or repatriation of existing collections. The premier Roebuck Iroquois skeletal collection studied by Knowles (1937) was repatriated by the Canadian Museum of Civilization to the Mohawk Nation Council of Chiefs in 1998. It had been held by the National Museum of Canada since it was excavated in 1912 and 1915 by William J. Wintemberg (1876–1941), one of the museum's first practicing archaeologists (Jenness 1941). Notwithstanding Knowles' excellent monograph, Janet Young, Physical Anthropology Researcher for the museum, undertook a comprehensive modern re-investigation of the skeletal remains prior to their departure as is the museum's current standard practice. All her data and a comprehensive photographic record are on file in the museum's Archives (see also Young 2004). Mention must also be made of a large series of Archaic period human remains that were held by the museum for 44 years following their

excavation in the Upper Ottawa Valley. Pfeiffer (1977) studied most of this material for her doctoral research at the University of Toronto. The remains were repatriated in 2005 but, again, not without first being documented in their entirety by Young (2009).

Canada does not have comprehensive federal legislation governing the excavation, research, or curation of indigenous archaeological human remains as is the case with NAGPRA in the USA. However, statutes, rules, regulations, and (or) guiding principles are separately provided by each of the country's ten provinces and three territories for archaeological work in their jurisdictions, including the excavation of human remains. Additionally, a 1992 Task Force Report on Museums and First Peoples co-sponsored by the Canadian Museums Association and Assembly of First Nations provides for a collaborative working relationship between indigenous people and museum professionals (Canadian Museums Association 1992). Further details and discussion of ethics and policies in the archaeological excavation and study of human remains in Canada may be found in Cybulski (2011).

Research

James E. Anderson's 1960s research and publications set the stage for work by his students and their students over the next several decades and into the twenty-first century. Summaries with comprehensive bibliographies for the studies of aboriginal remains can be found in contributions prepared for the *Handbook of North American Indians: Environment, Origins and Populations* (edited by Ubelaker 2006) by Cybulski (2006) for British Columbia and the Pacific Northwest, Katzenberg (2006a) for Ontario and the Great Lakes, and Keenleyside (2006) for the Arctic and Subarctic. Issues concerning European contact and aboriginal populations, where more bibliographic references can be found, have received treatment from a bioarchaeological standpoint by Saunders, Ramsden and Herring (1992), Cybulski (1994), and Pfeiffer and Fairgrieve (1994).

While much has been written about the ancestors in Canada of modern day First Nations and Inuit (see, for example, Merbs 1983, 2002, for more of the latter), the remains of early European settlers and military personnel in Canada, nineteenth century townsfolk, and Arctic explorers have not been ignored. An opportunity to excavate and study the remains of mid-eighteenth century colonial and British prisoners of war arose when Parks Canada archaeologists were assigned to monitor repair of the fortification walls of historic Quebec City in the 1980s (Cybulski 1988; Piedalue and Cybulski 1997). Dr. Owen Beattie (University of Alberta) and Dr. Anne Keenleyside (Trent University) discovered or assisted with the discovery of the skeletal remains of members of the ill-fated Sir John Franklin expedition to the Canadian Arctic (1845) and studied them for signs of scurvy and cannibalism,

finding as well high levels of lead in the bones (Beattie 1983, 1985; Keenleyside et al. 1997, 1996, 1989; Kowal et al. 1991). Bioarchaeological study of a cemetery for the War of 1812, discovered in Fort Erie, Ontario provided insight into trauma, disease, and place of origin of the soldiers buried there (Pfeiffer and Williamson 1991). Studies of other nineteenth century remains of EuroCanadian origin have included a Methodist cemetery in Ontario (Pfeiffer, Dudar and Austin 1989), a family plot in Ontario (Saunders and Lazenby 1991), and the St. Thomas Anglican cemetery in Belleville, Ontario. The latter has resulted in numerous publications of great benefit to methodology in bioarchaeology because of an associated complete set of burial records (e.g. Rogers and Saunders 1994; Saunders 2008; Saunders et al. 1992, 1995, 2002). Saunders and Ann Herring (1995) brought together an international group of scholars who were studying historic cemeteries, resulting in the edited volume, *Grave Reflections: Portraying the Past through Cemetery Studies*.

Henry Schwarcz, an isotope geochemist at McMaster University, recognized the promise of stable isotope analysis for resolving questions about past diet including coastal adaptations and the introduction of agriculture. Through his training and collaboration with Erle Nelson (Simon Fraser University), Brian Chisholm (University of British Columbia), Anne Katzenberg (University of Calgary), Christine White (University of Western Ontario), and Tracy Prowse (McMaster University), Canada has made significant contributions to the development of this field. Stable isotope studies of diet and methodological caveats have been carried out for prehistoric populations in British Columbia (Chisholm et al. 1982, 1983; Cybulski 2010; Lovell et al. 1986), and Ontario (Schwarcz et al. 1985; Katzenberg et al. 1995; Katzenberg 1989, 1992, 2006b; Harrison and Katzenberg 2003). Research on dietary adaptations in the Canadian Arctic has been carried out by U.S. researchers (Coltrain 2009; Coltrain Hayes and O'Rourke 2004).

Ancient DNA studies have successfully been carried out on 5,000-year-old skeletons from two archaeological sites in the interior of British Columbia, revealing the identification of a new aboriginal haplogroup (M*) at one of them (Cybulski et al. 2007; Malhi et al. 2007). Molecular studies have also detected the *Mycobacterium tuberculosis* in the Uxbridge ossuary sample of Ontario (Braun et al. 1998). Ancient DNA laboratories have been established in several Canadian universities. Shelley Saunders and colleagues established a laboratory at McMaster University which is now directed by Canada Research Chair, Hendrick Poinar. Dongya Yang, who received his Ph.D. from McMaster, now directs the ancient DNA laboratory at Simon Fraser University.

Canadian bioarchaeologists have worked in many parts of the world including Mesoamerica (e.g. White et al. 1998, 2000, 2001, 2004b; Spence and Pereira 2007) Peru (Nelson 1998); South Africa (Pfeiffer and Sealy 2006), Egypt (Lovell and Whyte 1999; Melbye 1983; Molto 2000; Tocheri et al. 2005; White and Schwarz 1994; White et al. 1999); Sudan (White 1993; White et al. 2004a); Portugal (Jackes et al. 1997a, b); Italy (Prowse et al. 2008; FitzGerald et al. 2006); and Japan (Ossenberg 1986).

Summary Statement

The earliest practitioners of human skeletal studies in Canada (1848–1958) brought knowledge from England and Scotland and some influence on later works. It was largely in the 1960s, however, that a tradition of Canadian bioarchaeology took root, nurtured by frequent interactions between Canadian and American archaeologists and physical anthropologists. In part, a commonality of research interests in aboriginal cultural areas bordered by Canada and the USA—the Arctic, the Northwest Coast, and the Northeast (Great Lakes)—likely stimulated similar approaches to the studies of past peoples.

A rich methodological tradition developed in the 1960s by James E. Anderson is evident in much of contemporary Canadian bioarchaeology. Population relationships studied through the analysis of non-metric skeletal and dental traits are now being supplemented by ancient DNA studies. Today’s palaeopathology includes modern diagnostic approaches along with classical descriptive methods. Modern histological and morphometric approaches have been added to the traditional gross anatomical methods of physical anthropology. International collaborations throughout the world have enriched studies of Canadian collections as well as the research questions and methodological approaches of Canadian scholars. Above all, ethical approaches to the study of human remains form an integral part of Canada’s bioarchaeological landscape through collaboration and cooperation between archaeologists, physical anthropologists, and contemporary indigenous and non-indigenous communities.

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