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Science in the Sub-Arctic: Traders, Trappers and the Smithsonian Institution, 1859-1870.

A Thesis Presented to the Faculty of Graduate Studies, University of Manitoba, in partial fulfillment of the requirements for the degree of Doctor of Philosophy in History.

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BY

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ABSTRACT

This thesis examines the activities and contributions of Hudson's Bay Company traders, northern natives and mixed blood labourers in the Smithsonian Institution's Exploration and Museum Programs between 1859-71. Traders and trappers living in the sub-arctic became involved with the Smithsonian programs after being visited by the American naturalist Robert Kennicott, and their efforts significantly increased the empirical basis of the zoological and anthropological sciences in North America. Northern collectors also played an important role in effecting the methodological reorientation that occurred in the natural sciences at mid-century. Data collecting was systematized and rationalized by Smithsonian scientists between 1850 and 1870, and the participation of the Mackenzie River collectors provided an opportunity to test the efficacy of the new collecting procedures while, at the same time, adding substantively to the Smithsonian natural history collections.

An examination of the nature and development of fieldwork -- how specimens were collected and processed, and by whom -- therefore figures prominently in this thesis. Both native and non-native collectors generally participated in the

scientific process as labourers. Some of the more sophisticated traders did enjoy the intellectual stimulation offered by science, but their contributions were, like those of their native counterparts, empirical and functional rather than theoretical or inventive. However, the importance of fieldwork as a scientific activity should not be minimized. Fieldwork played an essential role in debate and development within the zoological and anthropological sciences in North America. The formal and informal, as well as the economic and social, recognition that collectors received from Smithsonian scientists provides convincing proof of that importance. This thesis also examines the relationship between those rewards and the impetus to collect.

Both trader and trapper had very good reasons for "volunteering" their services to the Smithsonian. Specimens became a commodity. They were exchanged for both economic and extra-economic rewards. Data collecting activities were integrated within existing socio-cultural frameworks. Science was rarely an abstraction to the Mackenzie River collectors.

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PREFACE

One of the first successful attempts to organize scientific activities was made in 1846. The Smithsonian Institution was legislated into existence by the United States government, and it quickly assumed national, if not international, recognition. Even during its first twenty-five years, while its programs and philosophy were still taking shape, the Institution had acquired "an aura of antiquity," and the "status of a venerable symbol."[1] Perhaps such notions were premature, but the Smithsonian had, after all, been given considerable responsibility and authority. Government collections deposited with the Patent Office were entrusted to the Smithsonian in 1857, and early Smithsonian scientists also assumed responsibility for the coordination of future national collections, and for the development and planning of natural history, anthropological and meteorological research programs. The "venerable" institution was, moreover, symbolic of the institutionalization occurring in the sciences generally, and Smithsonian scientists were at the forefront of a movement to rationalize, and standardize data collecting processess. After 1850, the processess of collecting,

[1] Nathan Reingold, ed., Science in the Nineteenth Century: A Documentary History, American History Series (New York: Hill & Wang, 1964), p.153.

conservation and documentation had to conform to standards established by scientists at the Smithsonian.

Specimens poured into the Smithsonian from near and far. They came from places as different and distant as the far northern outposts of the Hudson's Bay Company Territories examined in this thesis, and from the tropical jungles of Latin and South America. They came from continental America, as well as from Africa and the South Pacific. And specimens kept arriving at the Smithsonian because the Institution's scientists, Joseph Henry and Spencer Fullerton Baird, did all within their power to ensure a constant supply of specimens and data. They enticed residents of far off places into becoming reliable correspondents and collectors. Baird and Henry incorporated field collectors, like those stationed at Forts Yukon, Simpson, Big Island, Good Hope Liard, Resolution and Rae,[2] within a network in which empirical data was exchanged for luxury goods and friendship, as well as for prestige and status within the scientific community.

Collecting in the field was undoubtedly the most elementary vehicle through which one could actually participate in science, but it was unquestionably <u>perceived</u> as a scientific activity by many of those persons involved

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[2] See map following the Table of Contents (pp.xi-xii) for details of the locations of the above posts. Unfortunately neither Fort Yukon, which was situated at the junction of the Porcupine and Yukon or Pelly Rivers, nor Fort Anderson, which was located on the Begh-ulateese River just inside the Arctic Circle, are noted on this map.

in fieldwork. This thesis examines the contributions and activities of one of these groups. HBC employees such as Roderick Ross MacFarlane, Bernard Rogan Ross, James Lockhart and Strachan Jones were convinced of the importance of their "scientific" work. They were similarly certain that they were, in fact, <u>doing</u> science. Their assumptions were not unfounded. These men, aided by their native and mixed blood "assistants," sent the Smithsonian more than 11,000 specimens between 1859 and 1866. The theoretical or abstract and speculative nature of science was perhaps never fully understood by either trader or trapper, but science as a purposeful and learned activity was easily integrated within both European and native cultural complexes.[3] This thesis examines how that integration occurred.

This thesis also examines how the collecting and scientific activities of northern traders and trappers benefited both scientist and collector. The benefits enjoyed by the Smithsonian are perhaps obvious. HBC collectors submitted a significant proportion of the specimens received by the Smithsonian at mid-century, and their specimens formed one of the many important additions to the empirical foundations of nineteenth century science. But conversely, this thesis examines the benefits derived by northern traders and trappers, from scientific activities.

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[3] The functionalism of science is discussed in Robert M. Young, "Science as Culture," <u>Quarto</u> 2(1979):7-8 and "Science is a Labour Process," <u>Science for People</u> 43-44(1979):31-7.

How did science function within the lives of northern collectors? What motivated people to volunteer their time for what was often an inglorious activity at best? The processes of collection and preservation were often labour intensive, tedious and offensive to at least one of the five senses. They required training and committment. Collecting was even hazardous on occasion, with rare specimens often obtained only with painstaking effort.

Sociological studies have found that scientific activities, like any other cultural phenomena, follow well defined rules and regulations that are determined by its participants.[4] These rules and regulations are reflected in the social structure of the community, and conformity within the scientific community is maintained through a reward system based on "gift-giving." The manuscripts, specimens or experimental results produced through scientific activity are often called "contributions," but they are "gifts."[5] Although scientists deny their interest in remuneration, peer recognition is highly prized, and the pursuit of that recognition both sanctions and motivates scientific activity. Even career or salaried scientists earn their reputations and status through their ability to advance

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[4] W.O. Hagstrom, "Gift-giving as an Organizing Principle in Science," in Sociology of Science: Selected Readings, ed., Barry Barnes (New York: Penguin Books Ltd., 1972), pp.105-120; and, Hagstrom, The Scientific Community (New York: Basic Books Inc., 1965). See Chapter 8 for fuller references on the sociology of science.

[5] Ibid.

knowledge:

> Scientists do not own the results of their research. The only intellectual property scientists have is the recognition as the one who contributed that knowledge to the advancement of science. This recognition, the response to a contribution to knowledge, constitutes the second half of the reward system. The first half is the contribution - [6]

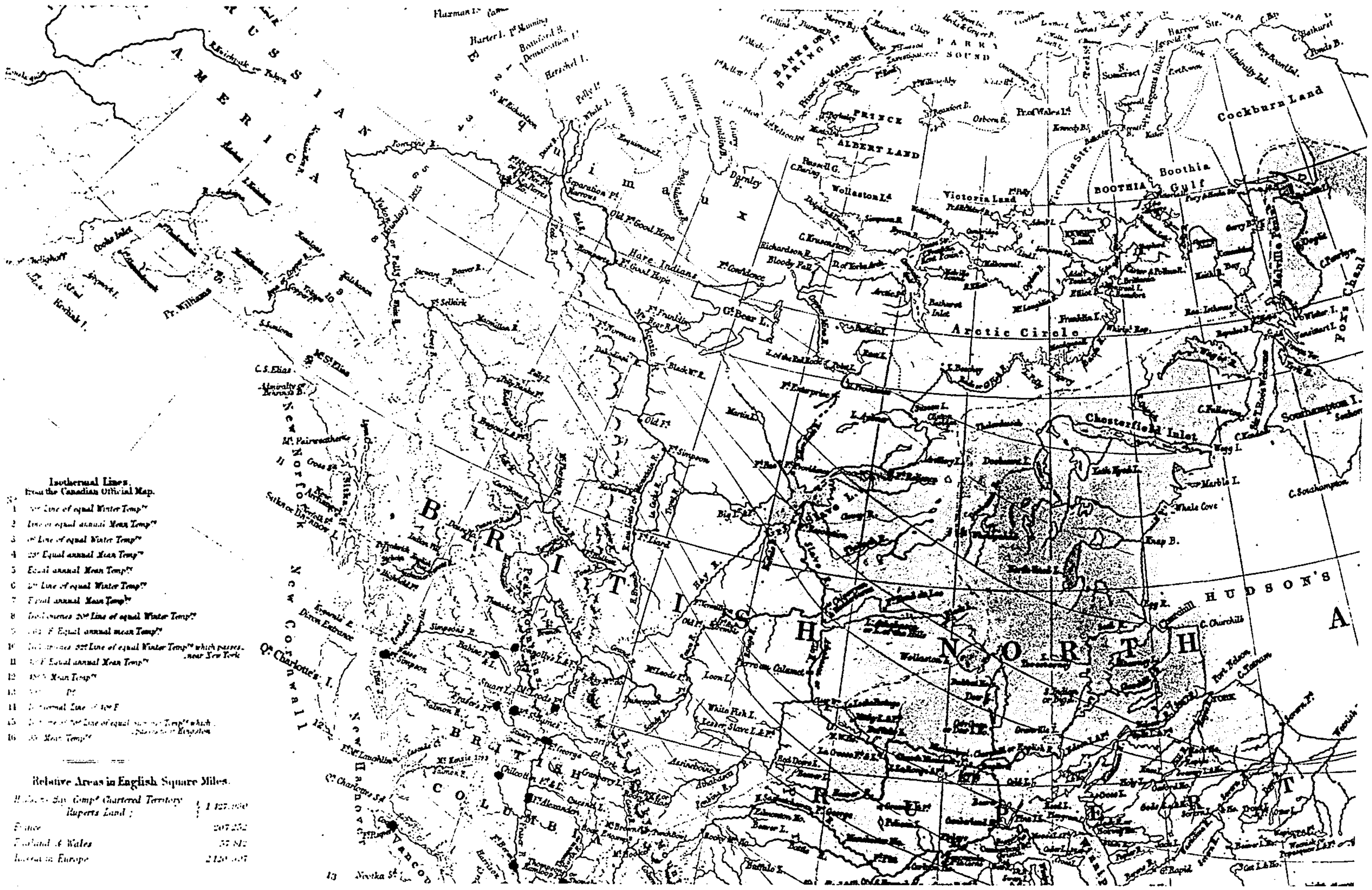
Scientists are _made_ through giving gifts, and "gift-giving" provides one of the most important social control and organizing principles within the scientific community.

Extra-economic remuneration was, in fact, very attractive to some northern collectors. Collecting, as a scientific activity, offered an opportunity to obtain the prestige and social status that had been expected, but denied through employment with the Hudson's Bay Company. Ennui and intellectual deprivation undeniably directed some of the more educated northerners towards collecting, but scientific activities had other rewards as well. Thwarted social mobility provided a strong, albeit generally unarticulated and unacknowledged, reason for collecting. Moreover, the less educated collectors, the natives and mixed bloods, collected for economic motives, plain and simple. They did not adopt the scientific ethos. They integrated scientific activities within an existing system of trade. This thesis examines both sides of a mutually benefical relationship. The contributions and activities of the Mackenzie River collectors conformed to the standards set by the Smithsonian

[6] Jerry Gaston, _The Reward System in British and American Science_ (Toronto: John Willey & Sons, 1978), p.10.

scientific community, and they were rewarded on both counts. The Smithsonian was, of course, happy to receive northern specimens. Its scientists were gratified that their inducements had been sufficiently attractive, and that their instructions had not only been appropriate, but that they had been adhered to remarkably well. One of the most important features of the Mackenzie River collections is, in fact, the extent to which they illustrate the nature of the non-creative scientific process. Northern collectors provided the labour needed to build the comprehensive collections wanted by the Smithsonian, and they collected and processed their specimens within the parameters that were being developed by a scientific community, that was as concerned with rigour and replicability, as it was with rarities.

CONTENTS



Map of British North America
Drawn by J. Arrowsmith, 1863.
H.B.C.A., P.A.M., G.3/11.

Chapter I

EXPLORATION AND SCIENCE IN RUPERT'S LAND, 1670-1860

From the beginning science was an integral part of the history of Rupert's Land. The Hudson's Bay Company's charter, granted in 1670, reflected the aspirations of a society that had accepted the benefits of the Scientific Revolution, and welcomed the commercial opportunities offered by the Age of Discovery. Only the Vikings and Christopher Columbus had been to America before 1500, but during the sixteenth century Spanish and Portuguese ships traversed both eastern and western seas. Spain and Portugal spearheaded searches for shorter routes to eastern markets, the exploitation of the natural and mineral resources of new found lands, and the dissemination of Catholicism. The English, French and Dutch responded predictably to the Iberian ascendancy and mercantilist companies were duly incorporated. Territorial claims were quickly made, and colonies even established before the end of the first half of the seventeenth century.

The new astronomy and physics had produced practical improvements in navigation at sea, and cartographic records hinted at the potential of vast, uncharted territories.

Moreover, the incompleteness of "scientific" data provided incentive for future exploration. The very inadequacies of European knowledge about the New World allowed them to cling to convictions that there was a shorter route to the Orient, and it encouraged kings and countries to seek their fortunes outside of European boundaries.

Motivations for European exploration fell into two broad categories when Rupert's Land was granted to the HBC. The new company could conceivably advance British territorial claims in the New World and realize dreams of easy access to Asian trade. The British Admiralty had already set its sights on discovering a shorter route to the Orient, and longstanding European rivalries solidified the territorial and commercial imperatives underlying British initiatives in North America. The "Adventurers" proposing trade through Hudson Bay could advance British claims against the French and Spanish in North America without taxing royal coffers. Charles II need only be generous in principle, leaving responsibility for the actual cost of imperial expansion in the northern half of North America with a commercial company. Charles assured the HBC that it would have no British competition for the furs, fishes and minerals of Rupert's Land, but he also ensured that the company would bear responsibility for the discovery, exploitation and defense of the natural resources of Rupert's Land.[7]

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[7] "The Royal Charter Incorporating the Hudson's Bay Company, 1670," in E.H. Oliver, The Canadian North-West: Its Early Development and Legislative Records, Two vols. (Ottawa:

The extent to which the British monarchy had intended the HBC to represent imperial aims in North America became the focus of some debate in the eighteenth century. The Company had undeniably emerged as a result of seventeenth century imperialist policies, but it took a narrow view of its overseas obligations, and exhibited no appreciation of having any imperial responsibilities beyond those explicitly related to the trade. HBC overseas policy concentrated specifically on the defense, consolidation and expansion of company trading rights in North America and, while furs were plentiful and competition distant, the Company seldom ventured beyond the Bay.

Responsibility for the Hudson's Bay Company's three hundred year struggle to protect and extend its commercial control over the North American northwest lay ultimately with a persuasive Frenchman, and an optimistic physicist. Pierre Radisson was convinced that a North West Passage existed through Hudson's Straits, and he argued his case before Robert Boyle, a prominent British physicist.[8] The French fur trader also suggested that the English stood to make a profit where the French had refused to tread, by conducting a trade in furs through the Bay. Radisson's schemes intrigued Boyle, who was involved in the

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Government Printing Bureau, 1914), 1:143-47.

[8] See: E.E. Rich, The History of the Hudson's Bay Company, 1670-1870, Two vols. (London: Hudson's Bay Record Society, 1959), and A.S. Morton, A History of the Canadian West to 1870-71 (London: Thomas Nelson and Sons Ltd., n.d.).

accumulation of maritime and geographical data for the Royal Society, and personally fascinated by the Arctic. Boyle's support for Radisson's ideas, and his connections with the Royal Society led him to petition Prince Rupert, a Society Fellow, to support a scheme that would test Radisson's views. Rupert subsequently became the first Governor of the HBC, and five of the eighteen founding members of the HBC, and several company shareholders, were Fellows of the Royal Society.[9]

But scientific activities were always subsidiary to legal and commercial considerations. The Society received but slight assistance in its attempts to prosecute its "philosophical observations" until well after 1713, when the Treaty of Utrecht protected Company boundaries from French encroachments.[10] HBC support for scientific pursuits was therefore minimal, initially because the Company had established only a precarious foothold at the Bottom of the Bay. Its occupation was seasonal until 1675, and trade at its bayside posts became even more difficult as European rivalries were transferred to North America.

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[9] One third of the charter members of the HBC were Fellows of the Royal Society, see: E.E. Rich, <u>The History of the Hudson's Bay Company</u>, vol.1, as well as vol.5 of the Hudson's Bay Record Society publications, edited by Rich, <u>Minutes of the Hudson's Bay Company, 1671-1674</u>, with an Introduction by Sir John Clapham (The Champlain Society, 1942), pp.xxvi-xxviii, and; R.P. Stearns, "The Royal Society and the Company," <u>The Beaver</u>, June 1945, pp.8-13.

[10] Stearns, "The Royal Society and the Company," pp.9-12.

There had been early enquiries into the validity and accuracy of French claims to lands north of the Great Lakes, and while there was a recognized need for cartographic data,[11] the first tentative exploration undertaken by the British company was only provoked by actual French movements into the Bottom of the Bay. By 1685 French competitors had penetrated the northern hinterland of New France and, in 1686, Chevalier de Troyes and le Sieur d'Iberville seized the HBC trading posts on the Moose and Albany Rivers, as well as Fort Albany which was just north of Moose Factory. The HBC responded by sending Henry Kelsey inland in order to intercept furs destined for French posts, and to find new sources of furs.

Kelsey's mission was ultimately launched as a means of increasing the numbers of furs brought to the Bay and, consequently profits, but continued French and British hostilities stymied HBC attempts to realize any immediate gains from Kelsey's expedition. By 1697 the forts on the Bay had changed hands four times, and the French maintained control of the trade until the Treaty of Utrecht restored the Bayside posts to the HBC in 1713. From 1685 until the British "conquered" New France in 1763, politics competed with profits in determining the course of exploration to the north, and to the west in North America.

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[11] E.G.R. Taylor, Introduction to Copy-Book of Letters Outward &c., Begins 29 May, 1680, Ends 5 July 1687, ed. E.E. Rich, assisted by A.M. Johnson, vol.11 (Toronto: The Champlain Society, 1948), p.xvi-xxv.

Kelsey's foray into the interior was also indicative of HBC exploration policy in another way. Neither men nor capital were ventured without provocation. Although the Company was actively developing and refining managerial and administrative policies for overseas trade, it remained much more conservative in its attitude to exploration and expansion throughout its first century of existence.[12] Their conservativeness was in part due to the favourable resolution of the problems which had been created by French competition, but it was exacerbated by the losses incurred when the one expedition that the Company had dared to sponsor, disappeared at sea. The Company had contributed between £ 7 and 8000 for an exploratory expedition under Captain James Knight, but when Knight and his men went missing in 1719 while searching for the North West Passage, the Company was reminded of the hazards of exploration.[13] This episode "... led the Committee to frown upon exploratory ventures unless they were closely and obviously connected with the maintenance and the enlargement of

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[12] A recent examination of the early business practices of the HBC has been done by Elizabeth Manche. She attributes the long-term success of the HBC to internal operational factors as much as to the external factors of geographical conditions, nature of the trade and the Company's Charter. A Company of Businessmen: The Hudson's Bay Company and Long-Distance Trade, 1670-1730 (Winnipeg: Rupert's Land Research Centre, 1988).

[13] Knight was briefly made Governor-in-Chief of Rupert's Land, 14 July - 13 September, 1717. See, Glyndwr Williams, ed., Andrew Graham's Observations on Hudson's Bay, 1767-91, with an Introduction by Richard Glover, vol.27 (London: The Hudson's Bay Record Society, 1969), footnote 1, p.243; see also, Ernest S. Dodge, "James Knight," DCB, vol.2, pp.318-20.

trade."[14] and, aside from an unsuccessful voyage north by Captain Scroggs in 1722, and the annual voyages made by the Company ships between London and the Bay, naval exploration was abandoned.

Captain Christopher Middleton, who had been placed in charge of many of the voyages made between 1721 and 1729, was convinced that a North West Passage existed, but he was unsuccessful in his bid to search for the passage on behalf of the Company.[15] Fifty years experience with ice bound seas deterred the HBC from risking either men or money on exploration in northern waters, despite increased cartographic sophistication and improvements to navigation that the astronomical sciences, terrestrial magnetism and methematics had produced during the fifteenth and sixteenth centuries. The Company eventually resumed searches for a northern passage in 1769, but a mandate was given for overland, rather than naval exploration. The Company sent Samuel Hearne in search of a passage nearly fifty years after Knight's tragic accident.

Meanwhile, French initiatives had again put the HBC on the defensive. The erection of self-sufficient inland posts, or _postes du nord_, was a refinement on earlier strategies aimed at intercepting furs en route to the Bay, and this plan was integrated within French attempts to

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[14] Rich, _The History of the Hudson's Bay Company, 1670-1870_, vol.1, pp.446-447.

[15] Ibid., p.562.

discover 'la mer de l'ouest.' French officials serving the state from the time of Henry IV to Louis XV were as interested in finding a passage to China as they were in establishing a North American colony but the French, unlike the English, placed their hopes in an overland route to the Pacific.[16] Jacques de Noyon was sent west in search of a passage to the Grand Ocean as early as 1688, and Zacharie Robutel de la Noue was similarly sent west in 1717. Noyon made it as far west as Lake of the Woods, while La Noue went as far as Rainy Lake but, obviously, neither succeeded in fulfilling French objectives, nor did they trespass over terrain that the HBC considered within its domain. Such was not the case, however, with Pierre Gaultier de Varennes, Sieur de la Verendrye, who was authorized by the French crown to search for a western passage to the China Sea. The crown also granted him the right, and the responsibility, of establishing fur trade posts en route. These posts would supposedly generate the funds needed to finance La Verendrye's expedition, since the crown refused to assume the costs of western exploration.

La Verendrye established Fort Pierre on Rainy Lake, Fort Charles at Lake of the Woods, Fort Maurepas at Red River and Fort Rouge at the mouth of the Assiniboine River, before returning to Quebec in 1742, and these forts did affect HBC

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[16] Lawrence J. Burpee, ed., Journals and Letters of Pierre Gaultier de Varennes de la Verendrye and his sons, with an Introduction by Burpee, vol.16 (Toronto: The Champlain Society, 1927), pp.4-7.

returns. La Verendrye's success also seemed to validate criticisms voiced by Arthur Dobbs, the Engineer-in-Chief and Surveyor-General of Ireland. Dobbs was especially interested in northern exploration, and after a decade of trying unsuccessfully to convince the HBC to extend itself northward, he blamed the Company for Britain's failure to find the North West Passage.[17] He contended that the North West Passage not only existed, but that it would be comparatively easy to discover if not for the HBC. He stated that discovery of the passage had thus far been purposefully prevented by the "Monopoly and Avarice of [the] Hudson's Bay Company," which had conspired to keep secret all information about North America.[18]

In 1744, Dobbs published his evidence against the Company in a book which attempted to demonstrate that the HBC had invalidated its Charter. He argued that the Charter had been invalidated because the Company had ignored its

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[17] E.E. Rich, ed., James Isham's Observations on Hudsons Bay, 1743, and Notes and Observations on A Book Entitled A Voyage to Hudsons Bay in the Dobbs Galley, 1749, Assisted by A.M. Johnson, with an Introduction by Rich, vol.12, Hudson's Bay Record Society (Toronto: The Champlain Society, 1949), p.xlvii-lii.

[18] Arthur Dobbs, An Account of the Countries adjoining to Hudson's Bay, in the North-West Part of America: Containing a Description of their Lakes and Rivers, the Nature of the Soil and Climates, and their Methods of Commerce &c., Shewing the Benefit to be made by settling Colonies, and opening a Trade in these Parts whereby the French will be deprived in a great Measure of their Traffick in Furs, and the Communication between Canada and Mississippi be cut off (London: J. Robinson, 1744), p.2. [H.B.C.A., PAM, RB FC3211 D6] See also, Rich, The Fur Trade and the North West to 1857, for synthesis of early exploration history of Rupert's Land, pp.110-116.

responsibilities to the British Empire with regards to colonization and exploration. Dobbs had had access to data on terrestrial magnetism and meteorology that had been compiled by Christopher Middleton between 1721 and 1729, and he consequently contended that Rupert's Land was suitable for colonization.[19] Middleton's data persuaded him that the soil was arable and the climate hospitable. He admitted that it was much colder in Rupert's Land than in Britain, but Dobbs felt that it compared favourably with climates in Sweden and Norway.[20] Moreover, the "Eskimoes" lived in even the coldest parts of the continent. Nor, apparently, was navigation as dangerous as portrayed by the Company. Dobbs specifically cited Middleton's voyages as proof of the navigability of Bay waters.[21] He also examined the Charter, the Company's Standard of Trade and its annual profits in an attempt to demonstrate how a conspiracy of silence had benefited corporate goals. He reproduced testimony from others with expertise on the New World, and itemized the supposedly self-evident benefits which would accrue through a shortened route to Eastern countries as additional evidence of the Company's duplicity and self serving attitude.

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[19] Rich, <u>James Isham's Observations on Hudson Bay, 1743</u>, p.xlviii.

[20] Dobbs, <u>An Account of the Countries</u>, p.2.

[21] Ibid., p.69.

Dobbs had easily overstated his case regarding the ease of navigability through northern waters, but by 1744 he was so convinced that there was an elaborate plot to prevent access to Rupert's Land that he even distrusted the opinions of his one-time friend and expert on northern navigation. Captain Middleton was apparently responsible for Dobbs' queries about the validity of the Company's Charter but, after a falling out over the origins and fate of some trade goods that had been mysteriously stowed on board Middleton's vessel in 1739, Dobbs became convinced that Middleton had, under instructions from the Company, given him false information about Rupert's Land.[22] Dobbs subsequently sold subscriptions on behalf of the North West Committee to finance naval expeditions in 1746-47, and he placed Captains Moore and Smith in charge of the _Dobbs_ and the _California_. These voyages, like those undertaken by Middleton on behalf of the British Admiralty in 1741, failed in their bid to find the North West Passage but while Middleton concluded that there was no northern passage, Dobbs regrouped and refocused his assault on the Company. His attacks on Company policy overseas had evolved into an attack on the principle of monopoly and, when he petitioned the King for a land grant analogous to that given the HBC in North America, he provoked a parliamentary enquiry into the validity of the HBC Charter.[23]

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[22] Rich, _James Isham's Observations on Hudson Bay, 1743_, p.lxii.

[23] Ibid., p.xc-xcix.

This enquiry made public, for the first time, Company activities in North America. It was also instrumental in bringing one of Rupert's Land's first natural history collectors and early ethnographers front and centre. Chief Factor James Isham testified at the enquiry, drawing on notes and observations made in his Journal, 1746-47, and on sixteen years' experience overseas. His testimony regarding the settlement of Rupert's Land and the feasibility of a North West Passage contradicted, perhaps unimaginatively, Dobbs' views, but his Journals were an unrivalled source of ethnographic and zoological information.

It is uncertain whether Isham received the Instructions regarding the collection of natural history specimens, that had been reissued by Governor Bibye Lake in 1735:

> Wee must repeat our former Order that You at a Proper season plant in boxes some Roots of the several sorts of Herbs, Plants, Grass & shrubs that are in your parts and save at a proper season some of the seeds, Berries, Cones or Kernels of all growing in Your Country and send them to Us also lett yr Surgeon give Us a particular Description thereof and their names and Qualities and what use the Natives put them to and send us an acctt in writing of the particulars of what You put on board of that kind, This Order wee require may not be neglected for the future[24]

[24] "London Correspondence Book Outward," A.6/5, fo.96d, Hudson's Bay Company Archives (H.B.C.A.), Provincial Archives of Manitoba (PAM), Winnipeg, Manitoba. [Hereafter cited according to the rules and regulations established by PAM, namely, H.B.C.A., PAM. and reference number]

but he nevertheless collected numerous botanical and zoological specimens. Isham and another Bay employee, Alexander Light, returned to England during the 1740s with specimens and notes,[25] and their efforts were used by George Edwards in the compilation of his four volume collection entitled _A Natural History of Uncommon Birds and some other rare and undescribed animals_ (1743-51). Edwards included illustrations based on ten birds collected by Light, and thirty-two birds collected by Isham.[26]

Edwards had received ornithological specimens from Light, through the Royal Society, after his return to England in 1745. Isham, likewise, took specimens from Hudson's Bay when he returned to London to counter testimony given by Dobbs at the parliamentary enquiry.[27] Isham also reported extensively on the Cree Indians of western Hudson Bay. The Royal Society had received, again via the HBC, as many as a half dozen North American native "curiosities" as well as sundry

[25] John Richardson, William Swainson and Rev. William Kirby, _Fauna Boreali-Americana, or the Zoology of the Northern Parts of British America: Containing Descriptions of the Objects of Natural History Collected on the Late Northern Land Expeditions_, Three vols. (London: John Murray, 1829-36), Part II, Birds, pp.ix-x. [H.B.C.A., PAM, RB QL151 .R5]; Edward A. Preble, "A Biological Investigation of the Hudson Bay Region," _North American Fauna_, No.22 (Washington: Government Printing Office, 1902, pp.23-24; James L. Baillie Jr., "Naturalists on Hudson Bay," _The Beaver_, December 1946, pp.36-39.

[26] Richardson, Swainson and Kirby, _Fauna Boreali-Americana_, Part II, pp.ix-x.

[27] See Preble, _A Biological Investigation of the Hudson Bay Region_, regarding the timing of Isham's return to London, p.24.

notes on northern American Indians prior to Isham's sojourn in Rupert's Land,[28] and while Isham's "Observations" on native customs and ceremony similarly reflected his era's curiosity about the exotic peoples of the New World, Indian vocabularies were included for practical reasons:

> His vocabularies were intended for the education of those who should be sent to trade, while his "small Observations on the Country" were presented for the perusal of the Governor and Committee.[29]

Isham's "Observations" were, however, ignored by the Company, thus inadvertently elevating to respectability a description of HBC territories overseas that was written by its most bitter critic. Arthur Dobbs' An Account of the Countries adjoining to Hudson's Bay provided the only published description of Rupert's Land in the 1740s, despite the Company's conviction that Dobbs was a serious threat to its trade:

> ... only perversity and ignorance could make men venture seriously for a North West Passage, so that to them [the London Committee] the Dobbs and California expedition was either a crazy and wilful denial of established geographical knowledge or something more reasonable perhaps but also more sinister -- an attack on the Company's trade and territories.[30]

Fears that Dobbs, or some other interloper, might try to establish a trade in Rupert's Land prompted official approval for the construction of Flamborough House, upriver

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[28] Stearns, "The Royal Society and the Company," p.10.

[29] Rich, Introduction to James Isham's Observations on Hudsons Bay, 1743, p.lxvi.

[30] Ibid., p.lxv and for quotation see p.lxxxi.

from York Factory.[31] The London Committee was still perhaps reluctant to take the offensive in the struggle for furs, but experienced overseas traders were less hesitant about expansion inland. During the 1750s and 1760s HBC traders such as Ferdinand Jacobs, Moses Norton and James Isham argued that the HBC must either trade inland, or travel inland to convince more Indians to come down to the Bay to trade and, in 1754, Anthony Henday was sent inland.[32]

Several exploratory expeditions eventually emerged as a result of the Committee's acquiescence to plans for inland expansion. The Company moved tentatively inland after receiving Andrew Graham's recommendations, based on his more than twenty years of experience on the Bay, and the results of Matthew Cocking's journey inland to assess the extent of the Montreal-based trade. HBC exploration was thereafter directed largely towards opening the northwest to the fur trade, and outmanoeuvering first the French-Canadians and, secondly, the Montreal based North West Company.

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[31] The motivation behind the construction of Flamborough House was quite unlike that underlying the construction of the HBC's first inland post. Henley House, which had been erected inland in 1743, had also been built as a means of combating French competition but it had been built on the personal initiative of Albany Master, Joseph Isbister.

[32] E.E. Rich, The Fur Trade and the North West to 1857, The Canadian Centenary Series (Toronto: McClelland and Stewart Ltd., 1967), pp.123-26; and J.B. Tyrrell, Introduction to Journals of Samuel Hearne and Philip Turnor Between the Years 1774 and 1792, ed. J.B. Tyrrell (Toronto: The Champlain Society, 1934; reprint ed., New York: Greenwood Press Pubs., 1968), pp.3-4.

Commercial rivalries quickly replaced the territorial imperatives underlying French and British expansion in the northwest prior to 1763. But despite a growing preoccupation with exploration and useable or useful science the HBC agreed, in the early 1770s, to ask its overseas employees to collect natural history specimens on behalf of the Royal Society.[33] The Society was acting on behalf of Thomas Pennant, who was a personal friend of Daines Barrington, Vice-President of the Royal Society, and the author of British Zoology (1768-69), Synopsis of Quadrupeds (1771), Genera of Birds (1773) and Arctic Zoology (1784-85).[34] Pennant needed specimens for work in progress and several HBC employees responded positively to the Company's request for specimens. Andrew Graham sent sixty-four specimens, Humphrey Marten and Moses Norton sent seventeen each, and Ferdinand Jacobs sent two specimens to London in 1771.[35]

Samuel Wegg, who was to become Governor of the HBC in 1782, chaired a committee struck on 26 March 1772 to deal with the HBC specimens. In 1773, the "Committee on Natural History" became a standing committee of the Royal Society. This committee was charged with describing and distributing the natural history specimens that had already been

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[33] Richard Glover, Introduction to Andrew Graham's Observations on Hudson Bay, 1767-91, ed. Glyndwr Williams, vol.27 (London: The Hudson's Bay Record Society, 1969), pp.xiv-xv and p.xxiii.

[34] Ibid., pp.xxii-xxiii.

[35] Ibid., pp.xxiii-xxiv.

collected, as well as future collections from North America.

Natural history specimens were sent out from Hudson's Bay in five consecutive years (1771-75) and these specimens were studied by John (Johann) Reinhold Forster, as well as by Pennant. Forster (1729-98) was a Fellow of the Royal Society and he became the first scientist paid specifically to represent British interests in their bid to circumnavigate the world.[36] Forster was paid £ 4000 for undefined duties while on board the _Resolution_ with Captain James Cook:

> Forster was given no specific instructions or assignments, required to submit no report of his findings, and permitted to keep all his records and his collections.[37]

Cook's expedition was not only charged with searching for "... unknown tracts of land that might exist within the bosom of the immense expanse of ocean that occupies the whole southern hemisphere."[38] but was instructed to collect data so as to correct the inaccuracies found in the accounts of previous circumnavigations. Cook was also instructed to look for the North West Passage through America, although his expedition differed from previous searches in that he

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[36] Ruth Dawson, "Collecting with Cook: The Forsters and their Artifact Sales," _Hawaiian Journal of History_ 13 (1979):5-16.

[37] Ibid., p.5.

[38] James Cook and James King, _A Voyage to the Pacific Ocean, Undertaken by the Command of His Majesty, For Making Discoveries in the Northern Hemisphere to Determine the Position and Extent of the West Side of North America Its Distance from Asia and the Practicability of a Northern Passage to Europe_, Three vols. (London: W. and A. Strahan, 1784), 1:v. [H.B.C.A., PAM, RB G420 C6, vols. 1-3]

was instructed to penetrate the continent from east to west, rather than following the traditional strategy of entering the continent via the Atlantic and Hudson's Bay.[39]

William Wales, one-time Mathematics Master at Christ's Hospital, London, and astronomer also accompanied the Cook expeditions.[40] Wales, like Forster, had a connection with the Royal Society and the HBC. In 1768 the Company had permitted Wales, accompanied by Joseph Dymond, to stay at Fort Prince of Wales in order to document the parallax of the transit of Venus (3 June 1769) for the Society. While abroad, Wales and Dymond kept a journal in which they described the topography, zoology and botany of the region, as well as recording meteorological, palaeontological and anthropological data. Wales was also associated some twenty years later with Samuel Hearne, one of the HBC's greatest explorers, when Hearne was preparing his journals for publication.[41]

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[39] "Secret Instructions to Captain Cook, Commander of His Majesty's Sloop the Resolution," Ibid., 1:xxxi-xxxv.

[40] Biographical information on Wales found in Tyrrell's Introduction to Journals of Samuel Hearne and Philip Turnor, p.61; Ruth Dawson, "Collecting with Cook: The Forsters and their Artifact Sales," p.6; and, Michael E. Hoare, "Two Centuries' Perceptions of James Cook: George Forster to Beaglehole," in Captain James Cook and His Times, eds. Robin Fisher and Hugh Johnston (Vancouver: Douglas & McIntyre, 1979), p.222.

[41] Richard Glover, Introduction to A Journey from Prince of Wales' Fort, in Hudson's Bay, To the Northern Ocean, Undertaken by Order of the Hudson's Bay Company, For the Discovery of Copper Mines, A NorthWest Passage, &c., In the Years 1769, 1770, 1771 & 1772, ed. R. Glover (London: A. Strahan and T. Cadell, 1795; reprint ed., Toronto:

Samuel Hearne (1745-1792) was sent inland from Churchill to "chart the route to the copper mine" by Chief Factor Moses Norton in 1769.[42] Norton had received samples of copper ore in 1768 from two Chipewyan Indians, Idotliaze and Matonabee, whom he had sent in search of the North West Passage. Norton then had the opportunity, when in London that same year, of suggesting to the Governor and Committee that the Company send someone west to verify native claims regarding copper deposits. Hearne, who had joined the HBC in 1766 after serving nine years in the British navy, was sent out with Matonabee to find the copper, establish a route to the copper fields, search for a North West Passage, and lay claim to undiscovered lands.[43] Hearne made two false starts before reaching the Coppermine River in 1772, but the journals he kept between 1769 and 1772 formed the basis of _A Journey from Prince of Wales' Fort, in Hudson's Bay, To the Northern Ocean_, Undertaken by Order of the Hudson's Bay Company, _For the Discovery of Copper Mines, A NorthWest Passage &c., In the Years 1769, 1770, 1771 & 1772_ (1795).[44]

Macmillan Co. of Canada Ltd., 1958), p.xlii.

[42] Glover, Introduction to _A Journal from Prince of Wales' Fort_.

[43] "Orders and Instructions for Mr. Samuel Hearne, from Moses Norton, 1769," in Introduction to _A Journey from Prince of Wales' Fort_, ed. Richard Glover, pp.lxvi-lxx.

[44] London: A. Strahan and T. Cadell, 1795; reprint ed., Toronto: Macmillan Co. of Canada Ltd., 1958.

Hearne began work on a manuscript only after being convinced by Dr. John Douglas, Thomas Pennant and William Wales, that his journals were worthy of publication.[45] All three of these men were associates of Wegg, who not only facilitated their acquaintance with Hearne but who, as Governor and member of the London Committee, allowed Hearne access to not only his, but other HBC journals. Moreover, these men also assisted in the preparation of Hearne's manuscript and the contributions made by Pennant and Wales increased the scientific value of Hearne's work, just as his observations enabled Pennant to include descriptions of North American fauna in his _Arctic Zoology_. The naturalist and the explorer exchanged information. Pennant gave English names to animals that Hearne had only identified by Indian names, and Hearne provided Pennant with information otherwise unavailable in Europe.[46] Hearne gave Pennant information on the seasonal habits and habitat, the geographical distribution, demographics, mating patterns, morphology and even on the economic import and edibility of well over seventy-five species. Hearne also included a chapter devoted to "A Short Description of the Northern Indians, also a farther Account of their Country, Manufactures, Customs, &c.," which, like the rest of his journal was intended:

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[45] Ibid., pages xxxviii, footnote 12 especially; xli and xlii.

[46] Ibid., pp.xxxviii-xxxix and Hearne, _A Journey from Prince of Wales' Fort_, Chap. 10, pp.229-94.

> ... for the amusement of candid and indulgent readers, who may perhaps feel themselves in some measure gratified, by having the face of a country brought to their view, which has hitherto been entirely unknown to every European except myself.[47]

Hearne's Journal was written when travel literature was an immensely popular genre, but even if he was motivated by little more than a fascination with the exotic, his Journals provided the most comprehensive account of the northern zoology and botany of North America available before 1831, when a zoological treatise based on collections made in Rupert's Land after 1819 was produced under the direction of Sir John Richardson.

The HBC could, towards the end of the eighteenth century, claim some credit for having promoted the sciences. Committee members were admittedly preoccupied with establishing a viable company and with justifying their charter of incorporation but concessions, small as they might have been, were made in the interests of the Royal Society and "science" from the outset. The Society had gained access to logs kept on Company ships, and had interviewed Company captains such as Zachariah Gillam in order to supplement navigational information that had already been obtained from questionnaires circulated in 1663. Committee members cooperated with the Society even as the Company was being incorporated.[48] The Society received

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[47] Preface to A Journey from Prince of Wales' Fort, p.xlix.

data on meteorological phenomena and magnetism kept by Captain Christopher Middleton while employed on Company ships, 1721-29 and, both zoological and anthropological reports and specimens had begun filtering into the Society as early as 1681.

In 1782, when Samuel Wegg, a long-time Fellow of the Royal Society became Governor of the HBC, there was the potential for even greater access to information about the Company's North American domain, and his interests in science did influence Company policy. Wegg was concerned with the Company's public image, and he saw science as a means to improve its corporate image.[49] He therefore publicized the Company's contributions to "science." He made Company records available, during the 1790s, to Aaron Arrowsmith and Alexander Dalrymple, cartographers and geographers, and opened Bay waters to British exploration. The London Committee also permitted, despite vigorous competition from the NWC, publication of the journals kept by Samuel Hearne while searching for copper deposits west of Churchill. Such openness was directly related to Wegg's tenure.

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[48] Stearns, "The Royal Society and the Company."

[49] G. Williams, Andrew Graham's Observations on Hudson's Bay, 1767-91, p.357.

International rivalry and challenges to the constitutionality of the Company's charter had, for most of the eighteenth century, provided the most compelling reasons for exploration in Rupert's Land. Commercial concerns, however, became increasingly important determinants of exploration and, from the last quarter of the eighteenth century until 1821 when the HBC merged with its chief competitor, the North West Company, science and exploration were subservient to corporate objectives. During the 1780s, the Montreal based NWC expanded aggressively across the northwest. They moved west much more aggressively than had any previous competition from the Canadas, forcing the HBC to do the same. Within fifty years posts dotted the northwest from the Bottom of the Bay and the Great Lakes, to the Pacific Coast and the Athabasca.

Samuel Hearne was, in 1773, again requested to travel inland. But this time he was instructed to build a post on the Saskatchewan River, in the Pasquia Hills.[50] Hearne established the first truly inland post at Cumberland House, but he was just one of a series of HBC men sent to counteract competition inland.[51] Matthew Cocking, Philip Turnor and Peter Fidler were three of the most important HBC traders and surveyors involved in the fight over the

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[50] J.B. Tyrrell, Introduction to Journals of Samuel Hearne and Philip Turnor, ed. Tyrrell, vol.21 (Toronto: The Champlain Society, 1934), pp.25-26.

[51] E.E. Rich, The Fur Trade and the North West to 1857, Chaps. 8,9 and 10.

interior with the NWC but others, including Robert Longmoor, Humphrey Marten, Joseph Hanson, William Tomison and Donald McKay were also instructed to claim fur trading territories, and to assess transportation routes and future trading sites. Similar efforts were made by David Thompson, Peter Pond, Daniel Harmon, Alexander Henry, Thomas Frobisher, Simon Fraser and Alexander Mackenzie on behalf of the NWC and, by 1800, much of the northwest had been explored by both companies.

The North West and Hudson's Bay Companies had hastily established posts and forts in the struggle to out-trade each other, and during this highly competitive period the London Committee had become acutely aware of the necessity of comprehensive and accurate information on all facets of the overseas trade. Finally, in 1814, the London Committee sent instructions intended to improve the transmission and quality of information reaching London regarding Rupert's Land.[52] The information contained in the correspondence and journals received up to this time would no longer suffice, and overseas governors were sent instructions detailing the information to be recorded in District Reports, Annual Reports and the "Journal of Daily Occurrences."

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[52] A letter written by the Home Board to Governor Thomas Thomas in Rupert's Land is the earliest found record of their instructions regarding the submission of Reports and Journals by HBC employees overseas. H.B.C.A., PAM, A.6/18, pp.149-213.

The Committee expected that District Reports would establish context. They were to describe to people, who had never themselves been to Rupert's Land, the geography, topography and climate of each region. Descriptions were to include a map of the area, noting the navigability of the rivers. The type and quantity of natural produce growing in each district were to be described, along with discussions of trading returns. In short, the Reports were to draw a general picture of the situation in each district and such data, while undeniably "scientific," had a practical application. The Company had finally recognized that science might be useful for commercial purposes. Descriptive science need not only serve king and country.

The Committee also wanted information about the posts within each district, including those belonging to the North West Company. Especially important was the potential for cultivation of crops around each post. It wanted to know about the general condition of the buildings and where they were located within the District. They were interested in the character and conduct of the men associated with each post, including information regarding special talents or skills. The Committee was also interested in any information pertaining to the Indians. They wanted to know how many families or hunters frequented HBC and NWC posts, their condition, their hunting area and if these Indians had notions about private property. They even wanted Chiefs and hunters identified individually. District Reports were intended as a preliminary step in an on-going process designed to compile information about individual districts within the whole of Rupert's Land. Ultimately the Committee would, through information from subsequent or Annual Reports, be able to produce a composite picture of the state of affairs in Rupert's Land.

Annual Reports were intended to build on the information supplied by the initial Reports. They were to detail changes to posts, personnel or the Indian population, as well as provide a narrative of the "principle occurrences," especially regarding the Indians and the Canadians. Annual Reports were also expected to contain itemized district returns and compare that year's trade with former years. Managers were expected to devise and detail strategies for improved trade, and the London Committee expected that the effects of those improvements could be ascertained through the post journal, which contained a record of daily activities.

Company officials therefore had far more information than they admitted in 1857, when a parliamentary enquiry reviewed the validity of the licence for Exclusive Trade that had originally been granted to the reorganized Hudson's Bay Company in 1821. The Instructions distributed in 1814 had resulted in 650 reports sent out from the headquarters of districts located within all four departments.[53] Twenty-two composite reports were produced in the year previous to the Enquiry and nine, of the twenty-two sites from which data was drawn, were located in temperate regions with soils conducive to agriculture. The Company's choice of reports was not quite representative since the ratio between reports submitted by the boreal and arctic, versus the parkland and prairie locations was approximately 2:3. However, Company protestations that Rupert's Land was largely uninhabitable for "civilized society" were no more contrived, than they were honest interpretations of the data set before them.[54] The Rupert's Land described by overseas employees was generally depicted as a rough, barren land - picturesque perhaps, but often suitable only for growing potatoes and

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[53] In 1821 Rupert's Land was reorganized geographically into territorial business units. The largest division was the department and four departments were organized: (1) Montreal - the Canadas, the King's Posts and later Labrador; (2) the Southern - part of the shore east of Hudson Bay and the territory between James Bay and the Montreal Department; (3) the Western - west of the Rocky Mountains, and; (4) the Northern - the territory between Hudson Bay and the Rockies, and between the United States and the Arctic Ocean. Each department was divided into two districts - north and south, each containing one major and several minor posts. See: H.A. Innis, The Fur Trade in Canada: An Introduction to Canadian Economic History (New Haven: Yale University Press, 1930), p.287 and G.P. deT Glazebrook, The Hargrave Correspondence, 1821-1843, vol.24, (Toronto: The Champlain Society, 1938), p.xx. Reports were sent out from the following districts between 1815 and 1856: Abitibi, Albany, Fort Alexander, Alexandria-New Caledonia, Fort Assiniboine, Attawapiskat Lake, Babine, Berens River, Big Lake, Brandon House, Cappoonicagomie, Carlton House, Chesterfield House, Fort Chimo, Chipewyan, Churchill, Colvile, Cumberland House, Dauphin, Eastmain, Edmonton, Escabilchewan, Flathead, Flying Post, Fort George - Columbia River, Gloucester House, God's Lake, Good Hope, Grand Lac, Great Whale River, Henley House, Isle a` la

turnips. Only negligible amounts of grain were ever produced. River travel was still the main means of transportation and communication, with many posts accessible only by light canoe. Reports were more likely to describe the hardships of portaging and sledding, than they were to extoll the virtues of the terrain. Information gathered at Forts Chipewyan, Abitibi, Norway House, Moose, Simpson and Mistassini was unlikely to support claims advanced by Canadian expansionists such as George Brown and William Draper, disgruntled spokesmen from Red River such as Alexander Kennedy Isbister, or British critics such as James Edward Fitzgerald.[55] Moreover, reports sent from these posts between 1815 and 1856, represented information on less than one-sixth of the thirty-seven posts located beyond the range

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Crosse, Indian Lake, Island Lake, Kamloops, Kenogamissi, Lac la Pluie, Lac Seul, La Cloche, Lesser Slave Lake, Long Lake, McLeod Lake, McLoughlin, Manitoba Lake, Martin Fall, Matawagamingue, Mesaugamee Lake, Michipicoten, Migiskan, Mistassini, Moose, Nelson River, Nerskweskau, New Brunswick House, Nez Perces, Nichikun, Nipigon, North West River, Norway House, Osnaburgh House, Oxford House, Fort Pelly, Pic, Red Lake, Reindeer Lake, Resolution, Rupert House, St. James Fort, Sandwich Islands, Sault Ste. Marie, Seven Islands, Severn, Simpson, Snake Country, South River House, Spokan, Tadoussac, Temiskamay, Timiskaming, Trout Lake, Vancouver, Vermilion, Victoria, Waswanysi, Weymontachingue, William, Winisk River, Winnipeg and York Factory. See H.B.C.A., PAM, Record Group B.

[54] See L.H. Thomas for a discussion and excerpts from the testimony given by Company officials, Simpson and Ellice, at the Enquiry. "The Mid-Nineteenth Century Debate on the Future of the Northwest," in <u>Documentary Problems in Canadian History</u>, vol.1, ed. J.M. Bumsted (Georgetown, Ontario: Irwin-Dorsey Ltd., 1969), p.215-16.

[55] Fitzgerald opposed giving rights to Vancouver Island to the Company and wrote a book advancing his case. <u>An Examination of the Charter and Proceedings of the</u>

where agriculture was practicable.

Company critics and Canadian expansionists had expressed their doubts about the validity of Company rights to exclusive trade in the Athabasca, Peace River, the Rockies, New Caledonia, the Mackenzie River Basin and along the Pacific Coast for at least ten years before the expiration of their license. But the Canadians were ill-prepared to present their case before the British parliament. After all, not one Canadian sponsored expedition had ventured beyond their western boundary and although there were speculations about the existence of mineral resources in the west, the Canadians had no evidence to support such claims. Sir William Logan had established the Canadian Geological Survey in 1842, but its activities were confined to the province of Canada until after Confederation.[56] Geological surveys of New Brunswick (1838) and Newfoundland (1839) had also been undertaken to assess mineral resources, especially coal, but little in the way of western exploration was undertaken.[57]

Hudson's Bay Company with Reference to the Grant of Vancouver's Island (London: Trelawney Saunders, 1849). [H.B.C.A., PAM, RB FC3207.4 F5]

[56] M. Zaslow, Reading the Rocks: The Story of the Geological Survey of Canada, 1842-1972 (Ottawa: The Macmillan Co. of Can. Ltd., in assoc. with the Department of Energy Mines and Resources, and Information Canada, 1975), pp.82-127.

[57] Suzanne Zeller, Inventing Canada: Early Victorian Science and the Idea of a Transcontinental Nation (Toronto: University of Toronto Press, 1987), pages 14, and 97-98.

The Select Committee of the British Parliament perhaps unsurprisingly decided in favour of the Company, particularly in light of the testimony given by Edward Ellice. Ellice pointed out that fur trade operations were located beyond the range of practical settlement, and he stated that the Company would relinquish their title to lands south of sixty degrees latitude, if the Canadian government compensated them for their loss and assumed responsibility for law, order and government.[58] Moreover, the paucity of information available on the northwest tended towards a decision favouring the HBC. The Enquiry was forced to rely heavily on data that was accumulated through Arctic explorations and controlled by the HBC, while the Canadian government had access to little information beyond that provided by opponents of the HBC such as Isbister and James Ross.

The Colonial Office therefore sponsored an expedition to the northwest and, in the same year, the Canadian provinces also mounted an expedition to obtain data on the northwest that was untainted by the HBC. The Canadian government sent an exploratory expedition under George Gladman and Henry Youle Hind, while the British government sponsored a similar expedition under the leadership of Captain John Palliser. These expeditions were sent to ascertain the "true" characteristics and agricultural feasibility of the region

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[58] Rich, The Fur Trade and the North West to 1857, pp.290-91.

which had, for thirty-six years, been a HBC preserve.

George Gladman, a retired HBC chief factor, led the first Canadian expedition to the northwest. The members of this expedition included Hind, William Henry Edward Napier (civil engineer) and Simon J. Dawson (surveyor). These men were requested to " ... ascertain the practicability of establishing an emigrant route between Lake Superior and Selkirk Settlement, and to acquire some knowledge of the natural capabilities and resources of the Valley of the Red River and the Saskatchewan."[59] They were also ordered to " ... procure all the information in your power respecting the Geology, Natural History, Topography, and Meteorology of the region ..." and to specifically record the characteristics of the country conducive to agriculture, for example, soil fertility, timber stands, temperature variations, levels of precipitation, flooding, freezing and so on.[60] Similarly, John Palliser's expedition which consisted of a botanist - Eugene Bourgeau, a magnetical observer - Thomas Blakiston, a naturalist-geologist - James Hector and an astronomer/secretary - John William Sullivan, was commissioned to assess the resources of the country lying between the western edge of Lake Superior and the Rocky Mountains. These men were also supposed to assess the

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[59] Henry Youle Hind, Narrative of the Candian Red River Exploring Expedition of 1857 and of the Assinniboine [sic] and Saskatchewan Exploring Expedition of 1858, Two vols. (1860 reprint ed., New York: Greenwood Press Pub., 1969),1:269-70.

[60] Ibid.

potential for transportation across the west to the Pacific Coast, perform surveys, and record meteorological, topographical, zoological and botanical data. They were to assess mineral and timber resources and, perhaps most importantly, they were to determine the feasibility of agriculture in Rupert's Land.

But the Hind and Palliser Expeditions, particularly Hind's expedition, differed significantly from most of the exploration undertaken in Rupert's Land during the first half of the nineteenth century. The HBC had increasingly initiated exploration in aid of expansion and, like the fur trade itself, even British exploration had a decidedly northern focus.

A northern orientation had dominated eighteenth century exploration in North America, and searches for the North West Passage were, for example, integrated within Captain George Vancouver's circumnavigation (1790-95) as naturally as they had been associated with Captain Cook's exploration of the South Pacific.[61] But the emphasis on northern exploration intensified after 1818, when the British government renewed the offer first made during the Dobbs Affair of 1745. A reward of £ 20,000 was again offered as an incentive to explorations in search of the North West

[61] "Instructions from Lord High Admiral of Great Britain and Ireland &c.," in George Vancouver, A Voyage of Discovery to the North Pacific Ocean and Round the World In Which the Coast of North West America has been carefully Examined and Accurately Surveyed, Three vols. (London, 1798), pp.xvii-xxii. [H.B.C.A., PAM, RB G420 V3]

Passage. Exploration of northern North America consequently escalated in the thirty years following this offer, with the British government sponsoring all naval expeditions, as well as many of the most important overland expeditions. Northern American exploration was integrated within the sphere of British foreign policy to an unprecedented extent.

There were, of course, exceptions to both tendencies. Scientists or collectors such as David Douglas (1799-1834), Karl Andreas Geyer (1809-53), Joseph Burke and Paul Kane (1810-71) occasionally passed through Rupert's Land, and HBC employees themselves sometimes dabbled in scientific activities. Douglas was a Scottish botanist who visited the north western United States in 1823 and again in 1830-33, as well as the Fort Vancouver district in 1824-27 and Red River in 1827. Douglas fuelled George Barnston's scientific interests, as well as contributing many important specimens to Hooker's Flora Boreali-Americana (1840).[62] Geyer was the editor of the London Journal of Botany. He visited Fort Colvile in the winter of 1843-44, and studied the flora of the region.[63] Joseph Burke was a gardener from Kew who spent time at York Factory, and collected specimens for the Royal Botanical Gardens while visiting in the Saskatchewan and Columbia Districts in 1843-44.[64] Paul Kane was an Irish

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[62] See Chapter 5 for information on Barnston, and see M.L. Tyrwhitt-Drake, "David Douglas," Dictionary of Canadian Biography, vol.6, pp.218-220.

[63] Grace Lee Nute, "A Botanist at Fort Colvile," The Beaver, Sept. 1946, pp.28-31.

artist who spent four years in the northwest drawing Indians. He also compiled ethnographic information, which he felt was essential if the general public was to fully appreciate his sketches.[65] In 1829, company men such as such as John Work responded to "Queries on Natural History," after the Company had agreed to the distribution of questionnaires prepared by the Natural History Society of Montreal.[66] By the 1840s men such as Chief Factor George Barnston, and Chief Factor Archibald McDonald were devotees of science.[67] McDonald had corresponded with Hooker, was an Honourary Member of the London Botanical Society, and a contributor to the British Museum. Even Simpson's residence at Lachine boasted a museum where he stored "curiosities"

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[64] Zeller, Inventing Canada, p.212 and G. Thomas, "The Smithsonian and the Hudson's Bay Company," Prairie Forum,x,2, Fall 1985, p.285.

[65] Paul Kane, Wanderings of an Artist among the Indians of North America, From Canada To Vancouver's Island and Oregon Through the Hudson's Bay Company's Territory and Back Again (London: Longman, Brown, Green, Longman, and Roberts, 1859), p.viii. [H.B.C.A., PAM, RB FC3213 K3] See also J. Russell Harper, "Paul Kane," DCB, vol.X, pp.389-94, and Painting in Canada: A History, second edition (Toronto; Buffalo; London: University of Toronto Press, 1981), pp.120-123.

[66] John Work's response can be found in Fort Colvile District Report, H.B.C.A., PAM, B.45/e/2, and the Company's assent to the Montreal Natural History Society's request is referred to in Resolution 92, 1829, Minutes of Council, Northern Department of Rupert Land, 1821-31, ed. R. Harvey Fleming, with an Introduction by H.A. Innis, vol.3, Hudson's Bay Record Society (Toronto: The Champlain Society, 1940), p.248. See footnote 1 on 248 as well.

[67] See Chapter 5 for information on Barnston. Information on McDonald's scientific activities comes from Nute's

collected in Rupert's Land and elsewhere.[68]

Unofficial or casual scientific expeditions such as those undertaken by Douglas, Burke and Kane, and the activities of their HBC proteges were, however, atypical of nineteenth century science and exploration in Rupert's Land. Until 1850, the HBC or the British government itself, through the Admiralty, had dominated exploration in Rupert's Land.[69] The HBC had jealously guarded its western frontiers against Russian encroachments, and American explorers were only welcomed after Lady Franklin's successful appeal to the American public. Henry Grinnell sponsored an expedition in search of the lost Franklin crew in 1850, thus marking formally, the beginning of the end of the HBC's strictly

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article on Geyer, see p.27 and from a journal kept by him while part of Simpson's expedition to the Pacific in 1828. In this journal he recorded his observations on the climate, soils, resources and potential for agricultural settlement in the northwest. Peace River, A Canoe Voyage from Hudson's Bay to the Pacific, By the late Sir George Simpson in 1828, ed. with notes by Malcolm McLeod (Ottawa: J. Durie & Son, 1872). [H.B.C.A., PAM, RB FC3205.1 M34]

[68] Susan Stewart, "George Simpson: Collector," The Beaver, Summer 1982, pp.4-9.

[69] Table 1.1 has been constructed on the basis of information compiled by Alan Cooke and Clive Holland in The Exploration of Northern Canada, 500 to 1920: A Chronology (Toronto: The Arctic Press, 1978). The following Key corresponds to Table 1.1.

- I - Exploratory Expeditions
- II - Expeditions to establish posts
- III - Supply Expeditions
- IV - Whaling Expeditions
- V - Franklin Search Expeditions
- VI - Depot laying and other expeditions associated with search expeditions

isolationist policy.

Table 1.1
Number and Types of Northern Expeditions

Years	1818-1846						
	I	II	III	IV	V	VI	VII
HBC	26	13	30	0	0	0	0
British	16	0	0	6	0	0	0
Church	0	0	0	0	0	0	1
Can.	0	0	0	0	0	0	0
U.S.	0	0	0	0	0	0	0
Years	1847-1861						
HBC	6	3	14	0	3	0	0
British	2	0	8	6	68	27	0
Church	0	0	0	0	0	0	6
Can.	0	0	0	0	0	0	0
U.S.	3	0	0	2	7	3	0

VII - Roman Catholic and Church Missionary Society Expeditions

HBC exploration initiatives had been proportional to advances made by the NWC on the fur trade of the northwest until 1821, but after the coalition, the unified fur trading concern harnessed energies in aid of expansion westward and northward. Most Company exploration was conceived with practical views in mind, and the HBC dispatched thirty-three expeditions north between 1821 and 1846 -- twenty-six exploratory, surveying or scouting expeditions, and seven charged with establishing posts. The Company sent men in search of new Indian traders in order to establish a profitable trade. The Company would then dispatch someone to set up a post in the territory. For example, Alexander and John McLeod were sent separately in 1823 and 1824 to establish trade with the Nahanni Indians, and to establish routes to new trading grounds. Peter Warren Dease was similarly sent, via the Liard River (1823), to find the Nahanni Indians.[70]

In 1837 the Company gave more comprehensive instructions to two of its employees. Thomas Simpson, a graduate of King's College, Aberdeen, who had joined the Company in 1829, accompanied Peter Warren Dease (1788-1863), a seasoned trader and explorer.[71] Dease had served the XY and the North West companies before being made a Chief Trader with the HBC

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[70] Ibid., pp.148-49.

[71] William R. Sampson, "Peter Warren Dease," in the DCB, vol.9, pp.196-199.

in 1821. He explored northern water routes for the Company until Franklin's Second Land Expedition, after which he was given responsibility for securing the provisions and the labour needed on Franklin's expeditions (1824-27). He was subsequently promoted to Chief Factor.

Dease and Simpson had been dispatched to survey the northern shore and, with any luck, find a passage through northern waters to the Pacific. They were instructed to "... trace the coast, from Franklin's Point Turn again, eastward, to the entrance of Back's Great Fish River."[72] Dease and Simpson were supplied with astronomical and surveying apparatus and instructed to "give names" to any new headlands, mountains, rivers or "other remarkable objects discovered." They also measured variations of the magnetic needle, recorded observations on the Inuit and Indian, and Simpson collected botanical specimens.[73]

When Simpson's death in 1840 (14 June) curtailed plans to implement his proposal for further explorations, the Company chose Dr. John Rae to replace the young explorer.[74] Rae had

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[72] Thomas Simpson, Narrative of the Discoveries on the North Coast of America Effected by the Officers of the Hudson's Bay Company During the Years 1836-39 (London: Richard Bentley, 1843), p.6. [H.B.C.A., PAM, RB FC3961 S5]

[73] "Appendix - List of Plants collected during the Arctic Journey of Messrs. Simpson and Dease, by Sir W.J. Hooker," Ibid., pp.409-418.

[74] Information on John Rae generally taken from, J.M. Wordie and R.J. Cyriax, Introduction to John Rae's Correspondence with the Hudson's Bay Company on Arctic Exploration, 1844-1855, ed. E.E. Rich, Assisted by A.M. Johnson, vol.16 (London: The Hudson's Bay Record Society,

signed on with the Company at Stromness in 1833, just months after receiving his medical licence. He was sent to Moose Factory where he stayed ten years as surgeon at a salary of £ 100 per year, before embarking on a career in exploration. Between 1846 and 1854 he commanded or seconded four northern expeditions.

In 1846 Rae set out from Churchill. His orders were to trace and survey the Gulf of Boothia in hopes that a passage to the Pacific might be found and, more generally, he was instructed to "... complete the geography of the northern shore of America."[75] Moreover, he received specific directions from Governor George Simpson, who instructed him to:

> ... do your utmost, consistently with the success of your main object, to attend to botany and geology; to zoology in all its departments; to the temperature both of the air and of the water; to the conditions of the atmosphere and the state of the ice; to winds and currents; to the soundings as well with respect to bottom as with respect to depth; to the magnetic dip and the variation of the compass; to the aurora borealis and the refraction of light. You will also, to the best of your opportunities, observe the ethnographical peculiarities of the Esquimaux of the country[76]

and collect any "curious" specimens of the same.

1953).

[75] John Rae, <u>Narrative of an Expedition to the Shores of the Arctic Sea, in 1846 and 1847, with Maps</u> (London: T.& W. Boone, 1850), pp.14-17. [H.B.C.A., PAM, RB FC3961 R3] See also Wordie and Cyriax, Ibid., p.xxvi.

[76] Ibid., p.15.

Rae's first expedition coincided with the ill-fated Franklin expedition, and in the following ten years Rae commanded two of the more than seventy-seven overland and naval expeditions sent out in search of the Captain and crew of the *Erebus* and *Terror*. But more important to the progress of the Franklin Searches was Rae's expedition of 1853-54 which, like his first expedition, was charged with surveying the northern coast. While surveying Repulse Bay, he learned from some Inuit that Franklin's ships had been seen in the vicinity of the Great Fish River. These people reported that the "white men" had all died four years previously, and Rae took this news with him when he travelled to England in 1854.[77] He also took tangible proof that the Inuit had seen the Franklin ships. Rae took several "relics" including monogramed silver forks and spoons, a silver serving plate and pencil case, fragments of gold and silver watches, some coins, and a few bits of iron, tin and ivory that had been found by Inuit.[78]

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[77] Ibid., p.lxxviii and lxxx-lxxxi.

[78] "List of Articles purchased from Eskimo," in *Copies of Instructions to Franklin (1845) and to Search Parties, Ordered by the House of Commons, to be Printed 13 April 1848*, Two vols., Vol.1, pp.832-33 and p.844. [H.B.C.A., PAM, RB FC3961.3 G7] See also "List of Articles purchased at Repulse and Pelly Bays," Letter from Rae to Archibald Barclay, Secretary Hudson's Bay House, London, 1 September 1854, in *John Rae's Correspondence with the Hudson's Bay Company on Arctic Exploration, 1844-1855*, pp.286-87.

Rae and his crew eventually collected half of the £ 20,000 reward, originally offered by the Admiralty in 1850 to anyone finding information on the fate of Franklin's expedition. But these monies were only received after the London Committee had convinced Rae to apply for remuneration, and had petitioned the Admiralty on his behalf.[79]

Rae only received his reward in 1856, after the Admiralty had examined a report compiled in 1855 by HBC employees James Anderson and James Green Stewart. These men had been sent out by the Company to confirm Rae's account, and to find the persons who had sold Rae the Franklin "relics." They were to:

> ... carefully collect and bring back with you whatever may be portable, more especially manuscripts; such articles will most probably be found in the possession of the natives, from whom they should be purchased at any cost.[80]

Anderson's report convinced the Admiralty that further searches would be futile.[81] Rae's information had obviously

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[79] Wordie and Cyriax, Introduction to John Rae's Correspondence, p.lxxxviii.

[80] "Copy of a Letter from Sir Geo. Simpson to Messrs. James Anderson, and James Green Stewart, Honourable Hudson's Bay Company's service, Northern Department, Rupert's Land, dated Lachine, 18th November 1854," in Copies of Instructions to Franklin (1845) and to Search Parties, pp.852-53. [H.B.C.A., PAM, RB FC3961.3 G7]

[81] Lady Franklin perhaps naturally disagreed with the Admiralty's decision and she organized one last expedition in search of her missing husband. In 1857 an expedition left England under the command of Captain Francis Leopold McClintock, who simply found further evidence to corroborate Rae's findings. See, Wordie and Cyriax, Introduction to John Rae's Correspondence, p.xc

been correct.

Arctic exploration increased exponentially after Franklin's disappearance but the British obsession to find a passage through northern North America had manifested itself twenty-five years earlier.[82] John Ross and William Edward Parry's first voyage to the Arctic marked the beginning of a second phase of the search for the North West Passage, and marked the beginning of an often incidental, but nevertheless important increase in knowledge of the north.

Information on the natural and human resources, as well as vast amounts of geographical data were accumulated in the next half century. Ross was not only instructed to make meteorological observations and scrupulously record their course, variation, bearings and distances travelled but was told that:

> All objects of natural history, geology, and mineralogy, are (if possible) to be brought carefully on board; and if any cannot be removed on account of their size, sketches and drawings are to be taken of them.[83]

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and F.L. McClintock, The Voyage of the 'Fox' in the Arctic Seas. A Narrative of the Discovery of the Fate of Sir John Franklin and his Companions (London: John Murray, 1859), pp.348-71. [H.B.C.A., PAM, RB FC3961.3 M3]

[82] Recently two popular accounts have traced Arctic exploration, see Pierre Berton, The Arctic Grail: The Quest for the North West Passage and the North Pole, 1818-1909 (Toronto: McClelland & Stewart, 1988) and Daniel Francis, Discovery of the North: The Exploration of Canada's Arctic (Edmonton: Hurtig Pubs., 1986).

[83] John Ross, A Voyage of Discovery Made Under the Order of

Ross, in turn, ordered his crew to collect specimens and then turn them in to him.[84] Many specimens were collected, or described and the Appendices attached to the published account of Ross' first voyage were extensive. They consisted of "Zoological" and "Geological Memoranda," a "Botanical Appendix" and data on magnetism and meteorology.[85]

The Ross Expedition returned to England in November and, within six months, the British Admiralty dispatched another naval expedition commanded by Captain William Edward Parry. Furthermore, the Admiralty decided to add land exploration to the naval expeditions that had been sent in search of the Passage previously. In May 1819, Captain John Franklin was sent overseas and charged with surveying the northern coastline. Franklin was to travel eastward from the Coppermine River, recording meteorlogical and magnetic data. He was to record any observable influence of the aurora borealis on magnetic fields, assess the commercial value of the copper deposits near the Coppermine River and, if possible, make other less specific scientific observations.[86]

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the Admiralty in His Majesty's Ships 'Isabella' and 'Alexander,' For the Purpose of Exploring Baffin's Bay, and Inquiring into the Probability of a North-West Passage (London: John Murray, 1819), p.234. [H.B.C.A., PAM, RB FC3961.2 R6]

[84] Ibid., p.235.

[85] Ibid., pp.v-cxliv.

[86] John Franklin, Narrative of a Journey to the Shores of the Polar Sea in the Years 1819-20-21-22, Two vols. (London: John Murray, 1823), 1:ix-xiii. [H.B.C.A., PAM,

Parry commanded two more naval expeditions (1821-23 and 1824-25), and during the latter expedition John Franklin was sent on a second overland expedition. Captain Frederick William Beechey simultaneously guided the Blossom around Cape Horn, up to Alaska. Optimists were sure that Beechey would meet Franklin and Parry,[87] after Parry had navigated northern waters and Franklin had completed his survey of the northern coast. Such was not the case. But the scientific information, that was accumulated during the three years that Franklin's crew spent in the north, filled almost one hundred and fifty pages of text. This data was attached to the travel narrative of Franklin's second expedition, published in 1828. These appendices contained only data pertaining to the physical sciences since the amount of information collected on the natural sciences warranted a separate publication:

> An Account of the Objects of Natural History, collected on our journey, being too voluminous to be inserted in the Appendix, has been reserved for a separate Work, which will be published as soon as possible, by Dr. Richardson and Professor Hooker, under the sanction, and by the assistance of His Majesty's Government.[88]

RB FC3961.2 F7]

[87] Cooke and Holland, pp.151-53.

[88] John Franklin, Narrative of a Second Expedition to the Shores of the Polar Sea, In the Years 1825,1826 and, 1827, Including an Account of the Progress of a Detachment to the Eastward by John Richardson (London: John Murray, 1828), p.vii. [H.B.C.A., PAM, RB FC3961.2 F7]

The first installment of this zoological "account" was published in 1829, when volume one of Fauna Boreali-Americana appeared.[89]

Fauna Boreali-Americana was written by the Scottish surgeon and naturalist Sir John Richardson (1787-1865), who had accompanied both Franklin overland expeditions.[90] Richardson was, however, assisted by his contemporaries in the preparation of this work. The ornithologist William Swainson not only attended to classification and synonymy but illustrated the figures in volume two, and Reverend William Kirby, agreed to arrange and describe the insects.[91] Richardson also relied heavily on his predecessors' labours in the field. Much of the data on northern zoology contained in Fauna Boreali-Americana had, in fact, been collected by others.

Richardson admitted to his reliance on the Natural History Appendices attached to the narratives of the Ross

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89 John Richardson, William Swainson and Reverend William Kirby, Fauna Boreali-Americana, or the Zoology of the Northern Parts of British America, Containing Descriptions of the Objects of Natural History Collected on the Late Northern Land Expeditions, Under Command of Captain Sir John Franklin, Three vols., Part I - The Quadrupeds, Part II - Birds, Part III - Fishes (London: John Murray, 1829-36). [H.B.C.A., PAM, RB QL151 R5]

90 C. Stuart Houston, Introduction to Arctic Ordeal: The Journal of John Richardson, Surgeon-Naturalist with Franklin, 1820-1822, ed. C. Stuart Houston, with a Forward by W. Gilles Ross (Kingston and Montreal: McGill-Queen's Univeristy Press, 1984), pp.xxii-xxiii.

91 Richardson, Fauna Boreali-Americana, 1:x.

and Parry Expeditions.[92] Moreover, Richardson also examined specimens collected off the Alaskan coast by Captain Beechey's expedition, and specimens collected by Richard King.[93] King was the naturalist aboard an expedition dispatched in 1833, under Captain George Back, to search for an overdue expedition commanded by John Ross.[94] Richardson examined the botanical and zoological specimens that King had collected while searching for Ross. Richardson also benefited from collections held privately, for example, specimens in the HBC Museum, London; specimens in Joseph Sabine's private museum, and specimens in Mr. Leadbeater's museum. The British Museum and the London Zoological Society also permitted him access to their collections, and contributions made by HBC employees were also incorporated within Richardson's work.[95] Richardson received ornithological and mammalian specimens from men stationed in the Rocky Mountains, on the Labrador coast, the Athabasca and Albany River Districts, and from Cumberland House.

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[92] Richardson, Swainson and Kirby, Fauna Boreali-Americana, vol.2, p.xiii.

[93] Ibid., 1:xix and 3:ix-xi.

[94] George Back, Narrative of the Arctic Land Expedition to the Mouth of the Great Fish River, and Along the Shores of the Arctic Ocean, In the Years 1833, 1834 and 1835 (London: John Murray, 1836), pp.15-16. [H.B.C.A., PAM, RB FC3961 B3] See also, Cooke and Holland, The Exploration of Northern Canada, p.160.

[95] Information on museum collections examined can be found in vol.2 of Fauna Boreali-Americana, p.xii. and information on the HBC contributions can be found in volumes one and three, p.xix and x.

Richardson stated that ornithological specimens were too bulky, and their preparation too time-consuming to receive much attention from a highly mobile expedition. Birds and eggs were also difficult to transport. Most of Richardson's scientific activities therefore centred on botany and "Mineralogy,"[96] although he had collected the ichthyological specimens described in volume three, as well as recording the data on numerous mammalian and ornithological species.[97] Richardson also relied on the descriptions of mammals and birds that had been made by Joseph Sabine and Thomas Drummond.[98] Sabine had accompanied the first Franklin expedition, and Drummond was Richardson's assistant on the second expedition.

The British had been relentless in their search for the passage, and a decade of doggedness had allowed the preparation of the earliest substantial scientific account of the zoology and botany of northern North America.[99]

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[96] Richardson, Swainson and Kirby, Fauna Boreali-Americana, vol.2, p.xiv.

[97] See Appendices in Houston, Arctic Ordeal, Appendix A - Bird Observations, pp.223-44 Appendix B - Mammal Observations, pp.245-55, and; Appendix C - Fish Collected, pp.256-61.

[98] Richardson was quite candid about the sources of his specimens, and was not reluctant to give credit to those who made his publication possible. Fauna Boreali-Americana, 1:xiv-xix.

[99] The botanical specimens were described and classified by William J. Hooker and the first volume of his work appeared in 1833. Flora Boreali-Americana, or the Botany of the Northern Parts of British North America, (1833,

Richardson's treatise remained authoritative for at least forty years, and while his scientific contributions were well acknowledged with a knighthood in 1846, medals, and an honourary degree from Trinity College (Dublin) in 1857, natural history collections had never been the primary motivation underlying Franklin's explorations of North America. The British Government never forgot imperial aims, and Franklin's expeditions conformed to the previous efforts that had attempted to establish quicker and safer routes to Asian markets. So too did an expedition commanded by John Henry Lefroy. Lefroy had been placed in charge of the magnetic observatory built in Toronto in 1840 by the British Royal Engineers and, in 1842, Lefroy and an assistant, William Henry, set out in search of the "magnetic north."[100]

The British government had sent Lefroy and Henry to the Arctic in order to collect data on meterological and magnetic phenomema requisite to improvements in the navigational sciences. The uncertainties of northern navigation had plagued oceanic travel for over two hundred years, but the disappearance of Sir John Franklin's naval expedition was a shocking reminder of the many hazards associated with travel in the Arctic seas. The British sent

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1840).

[100] George F.G. Stanley, ed., John Henry Lefroy: In Search of the Magnetic North, A Soldier-Surveyor's Letters from the North-West, 1843-1844 (Toronto: The Macmillan Co. of Canada Ltd., 1955). See also S. Zeller, Inventing Canada: Early Victorian Science and the Idea of a Transcontinental Nation (Toronto: University of Toronto Press, 1987), pp. 125-44.

sixty-eight expeditions with the express purpose of finding Franklin, last seen less than three months after leaving London on 19 May 1845, and even the HBC and United States government assisted in the search. Between 1850 and 1870 the HBC sponsored three search expeditions and directed all of its officers to assist British searchers by providing goods, servants and provisions.[101] These instructions were acted upon immediately. Arctic Medals were subsequently awarded by the British Admiralty to one hundred and ninety-two HBC employees for their efforts in the search for both the North West Passage and the missing Franklin Expedition.[102]

Franklin's disappearance was also pivotal to the emergence of a northern orientation in American exploration.[103] Nineteenth century American exploration had focused on the West and mid-West, but the Grinnell Expedition of 1850 initiated a movement north. There were fourteen expeditions - three in search of Franklin, three relief expeditions to assist those searching for Franklin, four whaling expeditions, and four scientific expeditions

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[101] Resolution 87 of Minutes of Northern Council, 1851. Resolution 88 directed HBC officers to keep an account of the costs expended with regards to the British search expeditions, and to forward this account to Lachine for settlement with the British government. H.B.C.A., PAM, B.239/k/3, p.21.

[102] Correspondence Regarding Arctic Medals and Certificates of Claim, H.B.C.A., PAM, E.15/11.

[103] Searching for the lost Franklin party was, according to John Edwards Caswell, the predominant motive behind American exploration in the Arctic. "United States Scientific Expeditions to the Arctic, 1850-1909," Ph.D. 1951, Stanford University, p.6.

leaving American points for the Arctic in the twenty-seven years previous to the Alaska Purchase.[104] Henry Grinnell sponsored two naval searches (1850-51 and 1853-55); the first expedition was commanded by Captain Edwin Jesse De Haven, and the second was under Elisha Kent Kane. Kane along with Isaac Hayes, James McGarry and William Morton conducted four overland searches by sledge.[105] Captain Charles Francis Hall led another American search in 1860 and, in the same year, Isaac Hayes led a scientific expedition in search of the North Pole.

Despite all this exploratory activity, the first <u>truly</u> scientific expedition to the north was launched in 1859. The Smithsonian had already received some specimens from Red River, following a visit there by Robert Kennicott, an eager young naturalist from Illinois.[106] Smithsonian scientists had also become acquainted with Dr. John Rae himself. Rae participated in the Smithsonian lecture series during the winter of 1858-59. He gave two lectures on "Arctic Explorations and the Probable Fate of Sir John Franklin."[107] The Smithsonian subsequently sent Robert Kennicott to examine the natural history of the Mackenzie River District

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[104] One of the four scientific expeditions was sent to the shores of James Bay, a northern locale, but south of the 60th parallel.

[105] Cooke and Holland, <u>The Exploration of Northern Canada</u>, pp.185-86 and 208-210.

[106] See Appendix 8.

[107] <u>SIAR</u>, 1858, p.43.

and the Yukon, and Constantin Drexler, a taxidermist employed by the Institution, was similarly sent to the James region.[108]

In both instances, scientific activities were paramount. Neither expedition was mounted as a means to advance directly political or economic interests. Neither expedition was concerned with territorial expansion, transportation routes, resource exploitation, or the suitability of the regions for settlement. In short, these were scientific expeditions. The directives under which these naturalists laboured had as their primary concern the birds, eggs, mammals, linguistic and ethnographic material which were to provide the foundation of the most comprehensive research and public facility to be established in North America in the nineteenth century. The Smithsonian attempted to obtain data on the natural history of the Arctic for reasons other than the obvious utilitarian or humanitarian imperatives that had characterized previous expeditions into Rupert's Land, and Arctic specimens formed a significant component of the first zoological and anthropological collections obtained by the United States National Museum. Specimens collected in the HBC territories provided the empirical data needed in ornithological research and, more generally, zoological specimens supplied evidence in support of a

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[108] SIAR, 1859, p.66. Memorandum from Joseph Henry to C. Drexler, 24 April 1860, Folder 16, Hudson's Bay Company Correspondence Collection, Smithsonian Institution Archives (SIA), Washington, D.C.

Lamarckian view of speciation. Moreover, anthropological artifacts and northern ethnographies were instrumental in the application of an evolutionary paradigm to cultural studies. Commentaries on "exotic" cultures were a well established component of travel literature but, by 1860, the scientific community was in the process of formalizing the methodology and motives for ethnographic research. Ethnologists were identifying and distinguishing <u>their</u> approaches from earlier ones, carving a niche for ethnology as a science. They were distancing modern cultural studies from pre-modern studies, which had their roots in literature and the humanities. Specimens of indigenous Arctic and sub-arctic culture were crucial to that development.

Great collections were made between 1859 and 1871. Smithsonian scientists developed an exploration program that elevated natural history and anthropological collecting from a subsidiary role, and they substituted a cogent collecting program for the often erratic and unreliable system that had filled their cabinets previously. The Smithsonian expeditions produced enormous amounts of zoological data, data that would form a significant component of the substantive basis of late nineteenth century scientific research, and these expeditions were themselves a test of the efficacy and applicability of field work to modern science. Scientific motivations had finally assumed a primary role in Arctic exploration.

Chapter II

THE NATURAL SCIENCES: DEBATE AND DEVELOPMENT, 1670-1880

The founding of the Royal Society and the HBC coincided with a transitional phase in the history of the life sciences, just as the Smithsonian expeditions that were dispatched to the Arctic almost 200 years later coincided with a later transition. The biological sciences emerged in the late nineteenth century and replaced the authority of natural history, just as "scientific" or "learned" natural history had displaced popular conceptions of nature two hundred years earlier. HBC employees made significant contributions to the empirical foundations of both phases, with the HBC collections representing some of the most important donations received by the Smithsonian Institution during the second transitional period.[109] Studies of speciation, zoological demographics and systematics were facilitated by northern specimens, just as earlier collections sent out from the HBC territories in North America had enabled European scientists to incorporate the flora and fauna of the New World into the Linnaean classificatory system.

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[109] SIAR, 1866, p.44.

The popular conception and early application of the study of nature originated with the human desire to control nature, and have nature serve human needs.[110] Practical and utilitarian considerations determined both motive and method. An anthropocentric vision of the universe ensured that plants and animals were studied to determine their usefulness to mankind, and they were therefore classified according to whether they were edible or inedible, tame or wild, useful or useless.

Once the learned variety of natural history appeared at the close of the seventeenth century, nature came to be studied in its own right, albeit as evidence of God's existence and divine purpose. The modern or learned conception of natural history which attempted to give order to the plants, animals and minerals found on earth -- through the collection, enumeration, description and classification of each and every specimen -- superseded the popular or folk approach to the study of nature, and nature was soon identified, categorized and classified according to morphological criteria. Less than fifty years later a standardized Latin nomenclature had virtually eradicated popular or folk classifications by educated persons.

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[110] Keith Thomas, Man and the Natural World: Changing Attitudes in England, 1500-1800 (London: Penguin Books, 1983).

John Ray (1627-1705) was one of the first learned naturalists.[111] He was a "parson-naturalist" and in the Wisdom of God Manifested in the Works of the Creation(1691) he set forth his views on the fixity of species, and on the divine origin and purpose of adaptation in the biological world. His work represented a rejection of the anthropocentric view that all plants and animals existed to serve humanity. Some plants and animals obviously did not answer man's needs. Ray suggested that these plants and animals had an importance in their own right. Their function might not be apparent, but it could be accounted for by divine wisdom and benevolence. With modification Ray's hypothesis formed the basis of the nineteenth century debates over the argument from design, and it laid the foundation for a circular argument which would last several generations. The harmony and order of nature which must, according to Ray, be attributed to God's Will, would soon provide observable and measurable proof of God's existence.

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[111] Information on the early naturalists was obtained from: Peter J. Bowler, Evolution: The History of an Idea (Berkeley: University of California Press, 1984.); Loren Eiseley, Darwin's Century: Evolution and the Men Who Discovered It (New York: Doubleday & Co. Inc., 1958; Anchor Paperback, 1961); H. Bentley Glass, Owsei Temkin, and William L. Strauss Jr., eds., Forerunners of Darwin, 1745-1859 (Baltimore; London: John Hopkins Press, 1968); Dov Ospovat, The Development of Darwin's Theory: Natural History, Natural Theology and Natural Selection, 1838-1859 (Cambridge: Cambridge University Press, 1981.); and John C. Green, The Death of Adam: Evolution and Its Impact on Western Thought (Iowa State University Press, 1959.)

Carolus Linnaeus, like Ray, believed in the fixity of the species and he also believed that God had created the species according to a supersensible plan. He doubted that a mere mortal could comprehend the motivation behind divine creation, but it was his duty as a naturalist to uncover the structure of this 'natural order,' and the classificatory framework that he devised to achieve this goal was instrumental in the systematization and modernization of the study of natural history.

Linnaeus aspired to a natural classificatory system, but the earlier work of Ray had already demonstrated that the task of grouping plants and animals with reference to all their morphological characteristics was unmanageable. He therefore devised an artifical system of classification based on one characteristic, the reproductive organs. His next step in making God's creation comprehensible was the application of a Latinized binomial nomenclature to the genera and species which had been identified on the basis of reproductive morphology. Linnaeus recognized the need for standardization in the criteria, the methodology and in the nomenclature of classification. These needs were addressed in his published works: Species Plantarum(1753), Genera Plantarum(1754) and Systema Naturae(1758).

The standardization of taxonomy, initiated by Linnaeus, both substantiated and clarified the existing belief in the fixity of the species. The formulation and application of a strict definition of species combined with a systematized classification and nomenclature of that defined species to intensify existing theological trends. Despite philosophical and scientific challenges, natural history and Christian theology coalesced into a comfortable cosmology by the end of the eighteenth century.[112]

English deists and French agnostics produced variations on the general doctrine of natural theology, but they had no difficulty in accommodating science with religion. The most irreconcilable and persistent critic of the Linnaean system was the Comte de Buffon, and his theories did not greatly influence the world view of the eighteenth century.[113] Theological beliefs in the harmony and perfection of nature postured as scientific laws, and the metaphysical boundaries between science and religion were often indistinguishable. There was no fundamental conflict between science and religion. Following Ray and Linnaeus the function of science was to discover God's laws in, and for, nature. Time was

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[112] The once traditional historical view that science and religion were at odds with one another has been refuted by many recent historical studies. For discussions of the interrelatedness of science and religion, and their role in determining world view see in addition to the already mentioned works of Peter J. Bowler, Dov Ospovat, H. Bentley Glass, Loren Eiseley, and Keith Thomas: Susan F. Cannon, Science in Culture: The Early Victorian Period (New York: Science History, 1978.) and Robert Young, Darwin's Metaphor: Nature's Place in Victorian Culture (Cambridge: Cambridge University Press, 1985).

[113] Buffon had hypothesized that degenerative change rather than stasis typified the history of the earth, and he also attempted to redefine the species on the basis of their ability to produce fertile offspring.

still conceived as limited and the species fixed. The appeal of natural history lay in its stabilizing influence in tumultuous times, and there was a correlation between the acceptance and advocacy of a doctrine stressing harmony, perfection and order, and the temper of the post-Restoration and post-revolutionary (Glorious Revolution, 1688) era in Europe and Great Britain.[114] Consequently, the theoretical and philosophical tenets of natural history and natural theology were consolidated during this period.

Reluctance to abandon the notion of a limited time scale resulted in the theory of catastrophism as an explanation of how the earth was formed in just six thousand years.[115] This theory permitted the interpretation of geological phenomena such as earthquakes and volcanoes within orthodox theological views of the Noachian deluge, but simplistic developmental theories soon appeared. The Neptunist and

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[114] The Development of Darwin's Theory, pp.35-36. The information in these pages is based upon Ospovat's synthesis of quotations found in Charles Gillispie's Genesis and Geology.

[115] The following narrative on the history of geology is based upon these works: Martin Rudwick, The Meaning of Fossils: Episodes in the History of Palaeontology (London: Macdonald; New York: American Elsevier, 1972); The Great Devonian Controversy: The Shaping of Scientific Knowledge Among Gentlemanly Specialists (Chicago: University of Chicago Press, 1985); Peter J. Bowler, Fossils and Progress: Paleontology and the Idea of Progressive Evolution in the Nineteenth Century (New York: Science History, 1976); Edward Salisbury Dana, et al, A Century of Science in America, With Special Reference to the American Journal of Science, 1818-1918 (New Haven: Yale University Press, 1918) and Stephen J. Gould Hen's Teeth and Horse's Toes (New York: W.W. Norton, 1983).

Vulcanist schools emerged in the early decades of the nineteenth century to challenge catastrophic theory.

Both of these theories tried to account for the mechanism by which terrestrial sedimentary strata were raised from beneath sea level. The Neptunist school postulated a retreating ocean (i.e. developmental) theory, while Vulcanists proposed either the cooling-earth (developmental) theory or a theory that the strata were formed by the alternate erosion and elevation of new land (steady-state approach). The steady-state approach tended towards the theory of uniformitarianism or actualism (non-developmental), later advocated by Charles Lyell. Unlike catastrophism, which considered past geological processes to be much more intense than contemporary ones, this theory proposed that past geological processes were similar to modern ones, and that study of these modern processes was sufficient to explain the geological history of the earth.

Attempts to order and classify the "Mineral Kingdom," including fossils, were also important in fostering new ways of seeing the world. Stratigraphic studies of mineral deposition also aided in the resolution of the problems associated with historical geology. The "father of English geology," William Smith (1769-1839), laid the foundations for nineteenth century analyses of geological and organic evolution in his works entitled: <u>Strata identified by Organized Fossils</u>(1816-20) and <u>Stratigraphical System of</u>

Organized Fossils (1817).[116] He discovered that fossils could be identified with a particular stratum and that they could also indicate a particular time or epoch in geological history.

The existence of fossils had long been recognized and attempts to come to terms with their meaning for history, especially Biblical history, had been unavoidable. In the late seventeenth century the "parson-naturalist" John Ray refused to consider the possibility that one of God's species could become extinct. He insisted that fossils were mineral rather than organic structures, and an entire century passed before sufficient proof in favour of the organic basis of fossils emerged. The French naturalist, Georges Cuvier invited discussion over the nature of fossils and the reality of extinction in On the species of living and fossil elephants (1796).[117] Receptiveness to the idea that some fossilized remains represented extinct species provoked serious discussion about the permanence of the species, and initiated a field of research that extended the time scale as much, or more than the developmental theories postulated by the Neptunists and Vulcanists.

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[116] Charles Schubert, "A Century of Geology - The Progress of Historical Geology in North America," in Edward Salisbury Dana, et al, A Century of Science in America, 1818-1918, p.117.

[117] This was just one of the papers at the base of Cuvier's reputation as the founder of modern vertebrate palaeontology. Georges Cuvier, Jean Baptiste Pierre Antoine de Monet, chevalier de Lamarck and Alexander Brongniart are considered the founders of modern palaeontology.

Cuvier transformed the classificatory system identified with Linnaeus. He was truly interested in the principles of classification, and his classificatory system symbolized the essence of the methodological revolution which occurred between 1758-1859 in taxonomy.[118] Cuvier classified animals on the basis of their anatomical structure, with specific reference to the nervous system. Consequently the animal kingdom was divided into four phyla based on internal body structure: vertebrata, mollusca, articulata and radiata. Anatomical comparisons were possible within a phylum, but not between phyla. He also ranked the animals within each phylum; for example within the vertebrates, the mammals were at the apex and the fishes at the bottom. In Cuvier's system, anatomical characteristics were not only used to identify organisms, but to give order or to systematize the animal kingdom.

Cuvier's work not only provided evidence for the organic basis of fossils, it fostered the integration of the process of fossilization, along with his theories, within the teleological framework of natural history.[119] British natural theologians adapted his notion of perfect adaptation

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[118] Ernst Mayr, The Growth of Biological Thought: Diversity, Evolution and Inheritance (Cambridge: Harvard University Press, Belknap Press, 1982), pp.188-196.

[119] Dov Ospovat, The Development of Darwin's Theory: Natural History, Natural Theology and Natural Selection, 1838-1859 (Cambridge: Cambridge University Press, 1981), pp.6-35. The following paragraph is based on these pages from Ospovat's book, which is the best analysis of the integration of Cuvierian science within British natural theology.

to their utilitarian teleology. His classification of the animal kingdom into four different but equal groups was not interpreted as an alternative to the hierarchical "chain of being," but as proof of the perfection of adaptation between form and function in nature. Likewise, his fossil reconstructions were not interpreted as evidence supporting the immutability of the species, but as evidence that fossils, like the rest of nature, conformed to a grand design. Theologians gladly supplemented theological "truth" with scientific "fact." Churchmen with a utilitarian bent, such as William Paley, assumed that every biological characteristic had a useful God-given purpose and they willingly appropriated Cuvier's evidence in support of functional adaptation. Cuvier's science substantiated western metaphysics. Beliefs in the harmony, order and purpose of the universe had been confirmed.

Evidence from the stratification studies of William "Strata" Smith and the fossil reconstructions of Cuvier stimulated speculations about the immutability of geological and even organic history. With the introduction and acceptance of the concept of change over time questions about the nature and eventually about the dynamics of change emerged. These questions, even through they ultimately challenged the authority of the Mosaic account, were formulated within the framework of Christian theology and, " ... the idea of opposing theology could not have been further from the minds of the main evolutionists. Their aim was to reconcile nature, God, and man."[120]

Debates over the nature and mechanics of change (debates now under the rubric of evolutionary theory) have three components, each of which contains opposing views from one set of issues within the larger debate.[121] Change may be developmental or it may be non-developmental or non-progressive. Lyell's uniformitarianism or "steady-state" theory of geological history is an example of non-progressive change. In the Principles of Geology, vol.1 (1830) Lyell especially rejected catastrophism as a mechanism for change, and he denied the possibility that fossils could prove that organic life had advanced from lower to higher forms.[122] Lyell also opposed speculations that the geological conditions of the past were more severe or that they even differed from those of his day. He felt that geomorphic processes such as erosion and elevation cancelled each other out, thereby leaving the primeval state of the earth's surface virtually unchanged, and he predictably viewed questions about the ultimate origins of

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[120] Robert M. Young, Darwin's Metaphor: Nature's Place in Victorian Culture (Cambridge: Cambridge University Press, 1985), p.10.

[121] See Stephen J. Gould, "The Eternal Metaphors of Palaeontology," in Patterns of Evolution, ed., A. Hallam (Amsterdam: Elsevier, 1977), pp.1-26, as well as Peter Bowler's synopsis of Gould's article in Evolution, pp.9-13.

[122] See Bowler, Fossils and Progress, for discussions on Charles Lyell, pp.4- 6 and pp.69-79.

the earth as beyond the scope of geology.

Diametrically opposed to the steady-state approach was the view that change equals development. The "cooling-earth" theory, which was advanced by Buffon to explain the development of the earth as a cooling and hardening process over time, and the developmentalism found in Louis Agassiz's creationism are examples of non-evolutionary change. Agassiz, who had been influenced by German Naturphilosophie, felt that " ... there was a preordained plan of development which ensured that progression was the key feature in the history of life."[123] His theory of development was also teleological:

> Agassiz had introduced a totally new form of progression by treating the ascent of life toward man as the key to the historical process observed in the fossil record, not as a mere by-product of changing conditions.[124]

Even during the first quarter of the nineteenth century most learned persons accepted the idea of change over time. Many even accepted the idea of developmental change, but a debate arose over the locus of control within the evolutionary process itself. There was a dispute over whether the process was determined by internal controls, specifically those set in place according to divine purpose, or whether evolution was controlled by external forces such as the environment. The outcome of the evolutionary process

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[123] Ibid., p.46.

[124] Ibid., p.45.

would be predictable and predetermined if the controls were inherent and internal, in this case divine, or it would be an "open-ended process" if control resided in the environment:

> ... there is no fixed direction of change, because each species responds as best it can to the challenges posed by an everchanging environment. The resulting evolution occurs in whatever direction most conveniently solves the problem, unless the species is unable to change quickly enough and becomes extinct. Adaptation is thus the sole driving force of evolution, and to some extent the way each species solves the problem confronting it will be a matter of chance.[125]

The final component of the evolutionary debate addressed the nature of the diachronic process. British natural theologians and Louis Agassiz offered an explanation that was analogous to that given by the catastrophists for changing topographies. They postulated that abrupt and cataclysmic change accounted for the appearance of new plant and animal species. An alternative to their theory of discontinuous change was offered by Darwin's theory of transmutation. Darwin's theory was analogous to Lyell's theory of geomorphic change. Biological change was as continuous and gradual as geological change. Incremental differences in form and function were produced as species adapted to their physical environments.

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[125] Bowler, Evolution, p.11.

The debates over the origins and development of the species have often overshadowed other avenues of enquiry in the nineteenth century sciences. But during the transition from final to efficient causes as explanations of organic genesis and development, there was a period in which formal causes played an important role in analyses of the plant and animal world.[126] Between 1830 and 1860 some naturalists rejected the physiological or ecological functionalism associated with natural theology, and attempted to uncover the "ideal patterns" manifested in the geographical distribution of plants and animals. The biogeographic tradition arose in the 1830s in Britain, and was associated with "philosophical natural history."

Several British scientists were within this tradition. The Scottish anatomist Robert Knox as well as his student Edward Forbes, the physicists Humphrey Davy and Michael Faraday, the classifiers William Sharp MacLaey and Edward Newman, the ethnologist R.G. Latham, and the museum curator Richard Owen were all philosophical naturalists. Charles Darwin was a self-proclaimed philosophical naturalist. All of these naturalists were philosophical naturalists because they assumed that ideal or "transcendental" patterns existed in nature, and because they believed that it was their task to determine the laws governing these patterns. Their search

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[126] Philip F. Rehbok, The Philosophical Naturalists: Themes in Early Nineteenth Century Biology, Wisconsin Publications in the History of Science and Medicine, no. 3 (Madison: University of Wisconsin Press, 1983).

for order and pattern in nature was not inspired by " ... Francis Bacon or John Herschel, but from Plato, Kant, Goethe, the German idealist Naturphilosophen, and, in Britain, from William Whewell, Samuel Taylor Coleridge, and the earlier Cambridge Platonists."[127]

Having collected data on the geographical distribution of plants and animals, the philosophical naturalists addressed the question of origins. Most rejected both the Biblical and the autochthonous view (ie. separate creations for every species wherever it may be located), and adopted the centres-of-creation hypothesis.[128] This theory claimed that each species originated but once, and was subsequently dispersed to the many locations inhabited in the nineteenth century.

One of these philosophical naturalists, Edward Forbes, turned his attention to the question of how species distribution had changed over time. In 1845 he introduced his land-bridge theory to explain how European plants had crossed over to Britain and, in 1846, he elaborated upon these ideas in an essay entitled "On the Connexion Between the Distribution of the Existing Flora and Fauna of the British Isles, and the Geological Changes which have affected their Area, Especially During the Epoch of the Northern Drift."[129] By the 1860s, supporters of Forbes'

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[127] Rehbok, The Philosophical Naturalists, p.9.

[128] Ibid., pp.151-153.

theory were called extensionists and his opponents were called migrationists: "Darwin insisted upon remaining a 'migrationist,' or advocate of natural transport, and referred to Lyell and Hooker as 'continentalists' or 'extensionists' for their continued support of theories involving continental extension."[130]

Despite debates over the ultimate origins of the species, most naturalists by the 1850s viewed change over time as developmental rather than undirected. Some, like the anti-evolutionary Agassiz who had been a student of Cuvier, viewed development as pre-determined by divine plan. Others, notably Darwin, rejected a teleological theory of development. Miraculous intervention and theories of discontinuous change were slowly being replaced by non-miraculous or natural explanations for continuous change. Age-old ideas of scala naturae, or conceptions of organic development as a linear ascent towards the mammalian primates, were also joined by notions of development as a process of differentiation and specialization.

Darwin and his contemporaries believed that an universal archetype, or what they referred to as a "germ" was the starting point of organic development. They added the idea that the path of development was non-linear, and

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[129] Ibid., pp.159-171.

[130] Ibid., p.190.

also redefined the notion of development:

> The direction of development was conceived to be not simply upward, nor a linear movement toward man; rather it was from the homogeneous germ or the unspecialized archetype toward the multitude of diverse and specialized animal forms.[131]

The concept of divergence or branching was replacing the belief in linear progression in all branches of natural history except studies of geographical distribution.[132]

Ideas of change and divergence challenged a world view secure in its knowledge of the stability, immutability and ascendancy of humanity, but conceptual accommodation succeeded in the nineteenth century. The argument from design was resilient but malleable, and theological rationalization ensured that "scientific" concepts such as adaptation and progression, were interpreted within the confines of nineteenth century religious beliefs:

> Divergence was the preordained unfolding of the various possibilities to which the class could be adapted. Paley's original claim that the Creator's benevolence could be seen in the perfect adaptation of each form to its environment gave way to the belief that design could be traced out in the process by which the class gradually assumed its more specialized adaptive structure.[133]

Compromise ensured that beliefs in universal order and harmony would remain intact, at least until Darwin had convinced the scientific community that organic development

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[131] Ospovat, The Development of Darwin's Theory, pp.116.

[132] Ibid., p.143.

[133] Bowler, Fossils and Progress, p.95.

occurred through adaptation by natural selection. The idea that natural selection rather than God produced new species remained largely unacceptable to both scientists and the learned public for many years after its introduction.[134] Practising naturalists resisted Darwin's naturalism and either adhered to the argument from design, or ignored theology completely:

> It is true that natural theology remained part of the world view of many naturalists and even produced some theological schemes of evolution, but for the scientific community as a whole, it continued only as what it had already become: a personal religious belief giving place to other requirements in day-to-day scientific work.[135]

The doctrines of natural history had a generally insignificant impact on the practical pursuit of natural history, although most nineteenth century naturalists collected, classified and sought the origins of species within a familiar, and generally sacred paradigm.

Despite resistance to Darwinian theory, dissension from the Mosaic account of Genesis had been present for several hundred years before Darwin.[136] The British had generally

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[134] See especially Susan F. Cannon on the role of Darwin in shattering the world view of the early nineteenth century. Science in Culture, pp.277-280

[135] Neal Gillespie, "Preparing for Darwin: Conchology and Natural Theology in Anglo-American Natural History," in Studies in History of Biology, eds., William Coleman and Camille Limoges (Baltimore; London: The John Hopkins University Press, 1984), p.135.

[136] On the pre-Darwinian debate over origins see John Farley, The Spontaneous Generation Controversy: From Descartes to Oparin (Baltimore; London: The John Hopkins Press, 1977); Stephen J. Gould, Ontogeny and Phylogeny (Cambridge, Mass.: Harvard University Press, Belknap

resisted the theory of spontaneous generation which substituted God's role as final cause, with organic causes but in Europe this theory was just one of the challenges to the Mosaic account of creation.[137]

Putrefaction supposedly proved that organic matter could organize itself and spontaneously generate life. It was initially believed that an external force was unnecessary in the process of creation but, during the seventeenth century, microscopic observation cast doubt upon existing ideas of spontaneous generation. Moreover, the invention and improvement of microscopy initiated studies of sexual generation, as well as stimulating cellular and parasitic studies.[138]

This interest in embryology resulted in two opposing theories of the nature and growth of the ovum.[139] The theory of preformation suggested that an exact replica of the parent organism is preformed in, and produced by, the parent. Its growth is mechanical and fixed rather than developmental, regardless of whether the preformationist

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Press, 1977); Peter Bowler, Evolution (1984) and, Ernst Mayr, Evolution and the Diversity of Life: Selected Essays (Cambridge: Harvard University Press, Belknap Press, 1976).

[137] Cartesian philosophy also relegated the creative impulse to the realm of the profane, and Cartesian philosophers postulated that living organisms were produced by the effect of the general laws of motion on passive matter.

[138] Farley, The Spontaneous Generation Controversy, pp.10-11.

[139] Ibid., pp.11-22.

ideas were ovist or spermist. Alternatively, a theory of epigenesis had received support in the mid-seventeenth century from William Harvey, the physician responsible for establishing the concept of of the universality of the ova or, as it was sometimes called, the primordium.

Renewed support for epigenesis emerged after the second half of the eighteenth century. The theory of epigenesis presumed the existence of homogeneous germ cells (ova), which developed into an organism through progressive growth and differentiation. Biological development is therefore not fixed but dynamic, and progresses from the homogeneous to the heterogeneous. Eighteenth century proponents of epigenesis rejected Harvey's belief in the divine nature of the primordium, or the doctrine of preexistence, and combined embryological theory with notions of spontaneous generation.

The doctrine of preexistence was an embryological theory formulated to explain spontaneous generation at approximately the same time as John Ray's natural theology was published in the late seventeenth century.[140] Preexistence was subsequently advanced as an explanation for all biological reproduction, extending earlier ovist and spermist preformationist ideas. The doctrine of preexistence insisted that the preformed germ was originally created by God, rather than by the body of the parent

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[140] On preexistence see Ibid., pp.11-30.

organism.

The tenets of natural theology and the doctrine of preexistence were obviously inseparable from Christianity and eventually, during the nineteenth century, from each other.[141] The doctrine of spontaneous generation flourished in Germany through its association with the idealism of _Naturphilosophie_, but it was generally associated with the evils of materialism, atheism and the political radicalism of the French Revolution. Irreverent, anti-Cartesian materialists such as D'Holbach, Diderot and Lamarck; Newtonians such as Pierre-Louis de Maupertuis, Buffon and John Turberville Needham; as well as Geoffroy Saint-Hilaire rejected preexistence in favour of spontaneous generation.

Members of the school of _Naturphilosophie_ combined biological progressivism with German romantic idealism. They believed in the ever-increasing perfectibility of biological development, with human life at the apex of the chain of being. The _Naturphilosophen_ were convinced of the indivisibility of the organic and the inorganic, of the profane and the sacred, within the universe. The adherents of _Naturphilosophie_ rejected the mechanistic world view of the eighteenth century. They insisted that the cosmos was an organism, not a machine.[142] Additionally, their

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[141] Ibid., p.29.

[142] L. Pearce Williams, "Kant, _Naturphilosophie_ and Scientific Method," in _Foundations of Scientific Method: The Nineteenth Century_, eds. Ronald N. Giere and Richard S. Westfall (Bloomington: Indiana University Press,

predisposition for teleological explanation reinforced their ideas of creation through spontaneous generation, epigenetic development and recapitulation.

Biological theory has always contained the substance of the idea that ontogeny recapitulates phylogeny, but it was among the Naturphilosophen that recapitulation became a central tenet.[143] Lorenz Oken, J.F. Meckel and Louis Agassiz argued that ontogeny, specifically stages of embryonic development, represented the course of human development through a repetition of the adult forms of the lower animals. Human life represented the culmination of physiological development in the animal kingdom, and adult stages of the lower animals were viewed as incomplete development or "Man disintegrated."[144] Pre-Darwinian recapitulationists interpreted ontogeny as analogous to, rather than representative of, phylogenetic development.[145] Moreover, recapitulationists were interested in providing proof of their analogy through the collection and dissection of pre-natal specimens, although Agassiz's work on fossil fishes extended the scope of this analogy. Agassiz

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1973), p.17.

[143] Gould, Ontogeny and Phylogeny.

[144] Oken, Elements of physiophilosophy, tr. Alfred Tulk (London: Ray Society, 1847), p.19 quoted in Gould, Ontogeny and Phylogeny, p.45.

[145] Ernst Haeckel, a post-Darwinian recapitulationist, formulated the biogenetic law. This law stated that embryonic development literally represented ancestral adult physiological traits.

introduced the notion that the fossil record paralleled embryonic stages, and he interpreted embryonic development as the repetition of "... a graded series of living, lower forms and the history of its type as recorded by fossils."[146] Belief that the animal kingdom was an organism eliminated concern over questions of _how_ ancestral adult stages were replicated in the fetus, and Agassiz's conviction in the divine origins of creation similarly precluded the substitution of causal analysis for analogy.

Interwoven amongst these debates was a tendency to modernity, disciplinary fragmentation and an increasingly complex methodology associated with the specialization that characterized the emergence of the biological sciences.[147] Natural history was subdivided into discrete fields of study. But research in the natural sciences was not only compartmentalized into botany, palaeontology, ethnology, philology, mineralogy and into the zoological sciences of ornithology, oology, mammalogy, entomology, conchology,

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[146] Gould, _Ontogeny and Phylogeny_, p.66.

[147] Ernst Mayr traces the general methodological transformation which occurred in the life sciences during the nineteenth century, and which was indicative of the development of the biological sciences out of the field of natural history in _The Growth of Biological Thought: Diversity, Evolution and Inheritance_ (Cambridge: Harvard University Press, Belknap Press, 1982). William Coleman more specifically examines the role of the experimental method in the reformulation of the biological sciences in _Biology in the Nineteenth Century: Problems of Form, Function and Transformation_ (Toronto: John Wiley and Sons, Inc., 1971), pp.159-166.

herpetology, ichthology and so on. There was also an extension of the traditional avenues of inquiry. Morphological and taxonomic studies were supplemented by studies of geographic distribution and species variation, and by analyses of biological function and dysfunction. Observation and fieldwork were extended, systematized and supplemented with laboratory experimentation. Great mounds of data invited methodological innovation, and the new methodology prompted a reconceptualization of the study of organic life.[148]

Nowhere was this new orientation more evident than with the adoption of the "experimental ideal" and the experimental method.[149] Experimentation allowed scientists

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[148] Fragmentation and methodological innovation were not, of course, confined to the life sciences. Developments in the geological sciences were analogous to the transition that had occurred in the biological realm during the nineteenth century. Just as the functional analysis associated with modern biology had superseded the taxonomy and morphology of the discipline of natural history, the geological sciences evolved from a static, descriptive morphology (mineralogy) into chronological studies of the development of the earth, and analyses of the dynamic processes through which specific landforms were created. Geomorphology, or the study of the processes of land formation became possible only after the idea that topography was constant, except for catastrophic intervention, was rejected. Charles Lyell's theory of uniformitarianism was crucial to the reassessment of existing explanations regarding the creation of landforms, but so to was the existence of apparent anomalies in the American topography. Phenomena such as valleys, "jumbled masses of 'diluvium,' polished and striated rock" and the presence of rolled pebbles and boulders in locations far removed from oceans, lakes or rivers confounded traditional theorists. All manner of explanations were proposed to account for their presence - weathering, catastrophic flooding, glaciers, icebergs and so on, but by the 1860s

to manipulate and control the conditions under which organisms were studied. It was "... an instrument of discovery, a method for verification and frequently the basis of practical laboratory instruction," and it promoted the the substitution of functional for historical explanations of organic phenomena.[150] This new method allowed scientists to extricate themselves from the fallacies which characterized the nineteenth century confusion of temporal and causal explanation, without disrupting their belief in the order and regularity of natural processes.

Biological functionalism did not truly establish itself alongside historical explanation before the 1880s and 1890s, but the shift away from theological functionalism, historical interpretations and the fascination with origins had begun early in the century. The theoretical contributions of Smith and Cuvier, Forbes and Owen, Lyell, Wallace, Darwin and many others were crucial to the development of the modern science of biology, but the

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glacial, wind and water erosion were accepted as bona fide geomorphic processes. See Herbert E. Gregory, "A Century of Geology - Steps of Progress in the Interpretation of Land Forms," in <u>A Century of Science in America, With Special Reference to the American Journal of Science, 1818-1918</u>, Edward Salisbury Dana, et al (New Haven: Yale University Press, 1918), pp.122-152, for an account of nineteenth century changes in the focus of the geological sciences.

[149] William Coleman, <u>Biology in the Nineteenth Century</u>, pp.159-166.

[150] Ibid., p.164.

adoption of the trinomial system of nomenclature represented one of the first practical and readily identifiable results of the tendency towards modernity.

The new taxonomy reflected a reconceptualization of the criteria by which zoological specimens were to be classified. By 1859 the method of "upward" or "compositional" classification, which was an "empirical" approach based upon the "inspection" and "grouping" of organisms, had replaced the older technique introduced by Cuvier. Cuvier's application of the principles of comparative anatomy had produced a concrete systematization of the diversity of the animal kingdom, but his system was, like the Linnaean and pre-Linnaean systems, based on "downward" or "divisional" classification of very large classes into innumerable sub-classes.[151] By 1859 only the remnants of the Cuvierian classificatory system (four different, but equal divisions of the animal world) remained and the upward system, which: " ... starts at the bottom, sorts species into groups of similar ones, and combines these groups into a hierarchy of higher taxa"[152] had extended and modified the French classificatory system.

This new approach to classification was "... believed to present the later views of some of the best systematic ornithologists with reference to the classification and

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[151] Ernst Mayr, The Growth of Biological Thought, pp.158-162.

[152] Ibid., p.192.

arrangement of the higher divisions of birds," and had been adopted in the early 1860s, by the Smithsonian Institution of the United States.[153] Curatorial staff had arranged bird exhibits according to the "progesssive method" which corresponded to "the physiological and geological development" of the species, thus adopting a classificatory system which "... commence[d] with the lowest, and finish[ed] it with the highest forms."[154]

The new system reflected a commitment to the branching conception of organic development that had become firmly established within the scientific community during the 1850s. The non-hierarchical classificatory system, which had first been hinted at in Linnaean parallelism and given form and substance by Cuvier, was finally realized by Darwin and his contemporaries.[155] Traditional taxonomy and the binomial system were intimately linked with the essentialism and downward classification that had prevailed before 1859. The shift to upward classification and receptiveness to evolutionary theory precipitated modifications in the methods of the science of taxonomy, which were eventually

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[153] Henry's introductory comments to an article written by Professor W. Lilljeborg entitled "Systematic Review of the Class of Birds," in SIAR, 1865, pp.436-450.

[154] Aves was divided into groups or sub-classes by two primary criteria, according to the "upward" method of classification: "irratibility," or muscular strength, vivacity and activity, and flightless locomotion. SIAR, 1865, p.438.

[155] See Dov Ospovat, "Natural History after Cuvier: The Branching Conception of Nature," in The Development of Darwin's Theory, pp.115-145.

reflected in the trinomial system of nomenclature.[156]

In 1885 the newly created American Ornithologist's Union (A.O.U.) introduced and adopted the new system of nomenclature. Their system added a third Latinized designation to indicate species variation, or sub-species, and abolished the idiosyncratic usage of appended abbreviations to indicate subspecies or varieties of species. The American system reiterated the Linnaean creed of classificatory consistency, incorporated evolutionary theory through its recognition of speciation, and accommodated the ever-increasing number of variations that had emerged as a result of the expanded system of field collection.

Taxonomic revisions were common in the second half of the nineteenth century. The Dall Code of the American Association for the Advancement of Science, for example, predated the A.O.U. Code by eight years.[157] Many European zoologists also advanced new classificatory systems. National codes were advanced by the Societe Zoologique de France (1881) and the Deutsche Zoologische Gessellschaft

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[156] These modifications were not directly introduced by Darwin, or produced specifically by his theory of evolution, but they were particularly compatible with his theories regarding continuity and common descent. Ernst Mayr, The Growth of Biological Thought, p.213.

[157] See David Heppell for a discussion of the various systems spawned by the Strickland Code. "The Evolution of the Code of Zoological Nomenclature," in History in the Service of Systematics, eds. Alwyne Wheeler and James H. Price (London: Society for the Bibliography of Natural History, 1981), pp.136-37.

(1894). The International Congress of Geology even proposed the Douville Code (1881) for classifying fossils.[158] British zoologists remained staunch supporters of the binomial system, although it had been revised by Hugh Edwin Strickland, and subsequently adopted by the British Association for the Advancement of Science in 1842.[159]

European, especially British, ornithologists responded negatively to the American classificatory system.[160] British antipathy to evolutionary theory tended towards classificatory conservatism whereas American ornithologists accepted the ramifications of evolutionary theory to taxonomy. American scientists exhibited no greater unanimity for the Darwinian theory of speciation than their European counterparts, but they refused to ignore the material evidence supplied by North American zoological specimens in

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[158] Ibid.

[159] The "Strickland Code" standardized the procedure for the application of binomials to zoological species, whereas a small number of continental ornithologists adopted purely idiosyncratic trinomial systems that were totally inconsistent, or unsynonymous, and were even less useful than the unrevised Linnaean system for purposes of comparative studies. These systems had absolutely none of the classificatory consistency which was essential to make taxonomy meaningful. See: Stresemann, Ornithology, From Aristotle to the Present, with a forward and epilogue on American ornithology by Ernst Mayr (Cambridge: Harvard University Press, 1975), pp.263-66.

[160] See Elliott Coues, "Historical Preface," Key to North American Birds, (1872), 5th ed. (Boston: The Page Co. Pubs., 1903) for a contemporary account of the adoption of the trinomial system and European resistance to it, pp.xxvi-xxviii. See Erwin Stresemann for a recent interpretation of the international taxonomic debate, Chapter 14, pp.250-268, especially.

favour of evolution. The American ornithological community generally accepted Lamarckian theory as a more appropriate explanation of how speciation occurred in the geographically disparate regions typical of North America.[161]

American scientists had access to specimens from both north and south. This expanded data base nurtured their tendency to favour the Lamarckian theory of speciation through acquired characteristics, and ignore Darwin's theory of evolutionary change through natural selection. Access to specimens from geographically isolated regions also fostered comparative analyses of climatically induced morphological differences, and the collections received from HBC employees stationed in the Mackenzie River District were especially important to such research. Robert Kennicott, the naturalist sent north by the Smithsonian in 1859, assured collectors of the importance of their specimens to the advancement of an environmentalist science:

> You must observe that in most cases it is not the intrinsic value of the specimens themselves (for I will own that most of the specimens are necessarily in a d__nable condition from being carried where you had no conveniences -) that renders them so important but their ability to tell us the story of Arctic zoology is what renders your collection so valuable to science.[162]

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[161] Stresemann in fact points out that the members of the "Bairdian School," in particular, had a Lamarckian bias and J.A. Allen, one of America's most famous nineteenth century ornithologists and a member of the Bairdian School, was a self-proclaimed Lamarckian. Ornithology: From Aristotle to the Present, pp.243-46.

[162] Letter from Kennicott to MacFarlane, 15 April 1864, Robert Kennicott Letters, 1863, 1865, SIA, RU 7072.

American scientists were so convinced of the correlation between geography, morphology and speciation that they over zealously "discovered" new species. And the trinomial system used to classify these "new found" variations sanctioned the tendency towards species multiplication. Its increased complexity provided a framework which would permit ample opportunity for every competent taxonomist to reclassify species on the basis of quite minor variations. Even Baird, Brewer and Ridgway were guilty of species splitting. For example, they erroneously classified the common gyrfalcon (_Falco rusticolus_) into three subspecies based only on seasonal colouration. They classified the white (_Falco gyrfalco_ var. _canadicans_), black (_Falco gyrfalco_ var. _labradora_) and brown (_Falco gyrfalco_ var. _sacer_) phases of the bird as separate varieties.[163] They were able to do so because the HBC collectors had sent examples of all three plumages.

The new taxonomy symbolized the transition that had been occurring in the life sciences. Despite criticisms from British ornithologists about the deleterious effects of the flexibility inherent within the American system, the First International Congress of Zoology (1889) called for an international system of zoological nomenclature, using the trinomen that had been introduced by the American

[163] See Appendix Seven for details of these classifications, as they were given in the _History of North American Birds_.

ornithologists.[164] As early as 1887, Elliott Coues, the American ornithologist who had been largely responsible for creating the new system, warned against the indiscriminate use of trinomial classification:

> The "trinomial tool" is too sharp to be made a toy; and even if we do not cut our own fingers with it, we are likely to cut the throat of the whole system of naming we have reared with such care. Better throw the instrument away than use it to slice species so thin that it takes a microscope to perceive them. It may be assumed, as a safe rule of procedure, that it is useless to divide and subdivide beyond the fair average ability of ornithologists to recognize and verify the result. Named varieties of birds that require to be "compared with the types" by holding them up slantwise in a strong light,- just as the ladies match crewels in the milliner's shop,- such often exist in the books of the describers, but seldom in the woods and fields.[165]

But his warnings were wasted. The system exacerbated and formalized the dispute that had been germinating between the "splitters" and the "lumpers."

The trinomen was a symptom rather than the cause of the rift between the British and American ornithologists, but the introduction of the trinomial system severed relations between the American and European ornithologists for nearly forty years. The divisions within the international ornithological community persisted until 1922, when the German ornithologist, Ernst Hartert, introduced a slightly revised trinomial system. But an International Code of

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164 See, "Introduction" to the International Code of Zoological Nomenclature, 3rd ed., 1985, for a discussion of the historical precedents of the code, pp.xv-xvi.

165 Elliott Coues, Key to North American Birds, pp.ix-x.

Zoological Nomenclature was not actually realized until 1961.[166] The Code that was finally accepted, and which continues to be accepted, incorporated the trinomen first introduced by the A.O.U. in 1885.[167]

The Smithsonian Institution and, consequently, field collectors such as those located in the sub-arctic also played a decisive role in the methodological transformation that characterized the development of the biological sciences generally. Naturalists such as Spencer Fullerton Baird, Thomas Mayo Brewer, Robert Ridgway and Elliott Coues, effected a revolution in the administration, participation and control of the processes of data collection. These naturalists and scientists were anxious to define and delimit the basis of their empirical datum, and Baird reckoned his first attempt was a success. The directions for collecting and preservation had, Baird reported, made a noticeable impact on the growth and composition of the collection just six months after their distribution in the field.[168]

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[166] Stresemann, Ornithology, pp.250-268.

[167] Sub-species are designated by a trinomen, species are designated by a binomen, and all the higher catagories, for example, the genera, family, order, and class are given uninomial designations. A specific example of the application of the sytstem can be seen in the scientific names given to the Barn Owl. The common barn owl is referred to as Tyto alba, but since there is a subspecies of that owl (Tyto alba pratincola), the common barn owl is more accurately described as Tyto alba alba or T.a. alba. See A.O.U. Checklist, p.272 and The World of Birds (London: Mitchell Beazley Pubs. Ltd., 1974), p.224.

The principles advocated by members of the "Bairdian School"[169] were ultimately internalized within modern scientific research procedures. These scientists strove to eliminate the role of chance in the composition of their exhibits, and in their studies of North American zoology. They sought to introduce an element of design into their scientific activities, just as the experimental sciences would eventually attempt to "guarantee control over the appearance and variability of the phenomena under investigation."[170] They attempted to go beyond the sporadic, primitive attempts at systematization found in the natural history handbooks predating Baird's instructional pamphlets. For example, the instructions written by Pierre Belon (c.1517-1564) in 1555 for the preservation of bird skins,

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[168] Even Baird's original pamphlet on the directions for collecting and preserving natural history specimens mentioned specifically the specimens needed for the Smithsonian collections. The Natural History Department of the Smithsonian Institution had, under Baird's influence, developed a policy of collecting North American natural history specimens, especially those unavailable for study in other North American or European institutions. Baird was able to state, just six months after the pamphlets had been released that their distribution had made a noticeable impact on the growth and composition of the Smithsonian collections. SIAR, 1851, p.45.

[169] The "Bairdian School" first received its name in 1884 from Dr. Leonard Stejneger. He distinguished the methods used by Baird, Brewer, Ridgway and Coues from European methods on the basis of scientific verifiability. Stejneger, Proc. U.S. Nat. Mus., 1884, VII, p.76, quoted in W.H. Dall, "Professor Baird in Science," SIAR, 1888, p.735.

[170] See William Coleman on the characteristics of the methodology associated with experimental science. Biology in the Nineteenth Century, p.159.

and suggestions given by John Woodward (1665-1728) for "making observations in all parts of the world" in 1696 were two of the earliest attempts to focus the activities of specimen collectors.[171] James Petiver (1663-1718), a London apothecary, supplied preservatives to explorers in America, and he also outlined the steps associated with stuffing birds for display purposes. J.R. Forster described the types of information relevant to identify captured species in his Catalogue of the Animals of North America (1771), and William Swainson wrote a book entitled Instructions for Collecting and Preserving Subjects of Natural History and Botany (1808).[172] F.M. Daudin's (1774-1804) Traité elementaire et complet d'ornithologie, ou histoire naturelle des oiseaux (1800) suggested topics accessible through field observation, and Friedrich Tiedemann's (1781-1861) Anatomie und Naturgeschichte der Vogel (1810-14) was Daudin's German equivalent. Standards for British field ornithology were established by George Montague's Ornithological Dictionary or, Alphabetical Synopsis of British Birds (2 vols., 1802 and 1813).

[171] John Woodward, "Brief Instructions for making observations in all Parts of the World: As Also for Collecting, Preserving, and Sending Natural Things. Being an Attempt to Settle an Universal Correspondence for the Advancement of Knowledge both Natural and Civil. Drawn up at the Request of a Person of Honour: and presented to the Royal Society," with an Introduction by V.A. Eyles, F.R.S.E. Sherborn Fund Facsimilis (London: Society for the Bibliography of Natural History, 1973).

[172] Information on the earliest known instructions found in Stresemann. He provides some detail on the contents of these early publications. See Ornithology, pages 26, 47-48, 79, 179, 294-95 and 298.

Baird's field instructions differed from these earlier handbooks in that his instructions consciously effected a transformation from casual to systematic collecting, and defined collections more specifically. Baird may not have been the first person to prepare instructions for collecting and preserving natural history specimens, but he did institute the first <u>sustained</u> program of comprehensive field instruction. Baird believed that hypothetical verification was possible only through analyses of large numbers of specimens and, in 1881, William H. Dall, President of the Biological Society, paid tribute to Baird's principles. Dall was the Assistant Secretary's friend and colleague, and he claimed that Baird was personally responsible for the differences that <u>he</u> discerned between the European and American approach to ornithology:

> ... the Bairdian School of Ornithologists, [is] a school characterized by exactitude in matters of fact, conciseness in deductive statement, and careful analysis of the subject in all its various bearings. Its work is marked by a careful separation of the data from the conclusions derived from them, so that conclusions or arguments can be traced back to their sources and duly weighed, ...[173]

American scientists such as Baird were not stereotypically inductive or empiricist, but rather cautiously deductive. Baird insisted on testing theory, and the Smithsonian collections enabled scientists to study North American zoology "... at first hand rather than accepting second-hand

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[173] W.H. Dall, "Professor Baird in Science," <u>SIAR</u>, 1888, p.735.

accounts from European museums."[174] Systematic data collection was essential for theoretical rigour and Baird's principles, as well as the institutionalization of scientific activity and the HBC field collections, foreshadowed the emergence of the new "scientific ideal" -- an ideal characterized by the experimental method.

Baird's new approach to data collecting also extended well beyond the field of ornithology. At least ten field manuals, some having several editions printed, were published during the first eighteen years of Baird's tenure at the Smithsonian. These manuals provided instructions for the collection of virtually every type of natural history specimen imaginable.[175] But the systematization of field work that developed under Baird's administration at the Smithsonian extended even beyond the zoological sciences, into the rapidly expanding fields of ethnology and archaeology.

Anthropology as a disciplined field of scientific enquiry was just beginning to assume its modern form during the 1860s,[176] and two of the most significant manifestations of

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[174] George Daniels, Science in American Society: A Social History, pp.184-185.

[175] Bibliography of Smithsonian Publications, SIAR, 1868, pp.429-450. See also SIAR, 1860. p.417.

[176] The transformation of ethnology as a discipline within the humanities, into anthropology as a natural science has been identified with the mid-nineteenth century by Curtis M. Hinsley in his study of the Peabody Museum of American Archaeology and Ethnology. See, "From Shell-Heaps to Stelae," in Objects and Others: Essays on

that transformation were introduced by the Smithsonian. The "Instructions for Archaeological Investigations in the U. States" and the "Instructions Relative to the Ethnology and Philology of America," that were issued by the Smithsonian Institution during the period in which the Arctic and sub-arctic collections were made, anticipated the reorientation of a discipline which, once established, rendered ad hoc donations obsolete.[177] The Smithsonian Institution had responded to the need for a systematized field procedure which emphasized the collection of "scientific" facts. Descriptive accounts of non-European or exotic peoples had long been committed to paper out of curiosity, a fascination with the bizarre or unfamiliar, the desire to titilate and amuse the readers of travellogues, or for the immeasurably practical and immediate purposes typical of those accounts compiled by early fur traders, colonial administrators or missionaries. But a new breed of scientist was emerging - the social scientist. Social scientists recognized the limitations of ethnographic materials that had been

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Museums and Material Culture, ed. George W. Stocking Jr., History of Anthropology, vol.3 (University of Wisconsin Press, 1985), p.51. Elman Service, A Century of Controversy: Ethnological Issues from 1860 to 1960 (Orlando; San Diego; New York; London; Toronto; Montreal; Sydney; Tokyo: Academic Press, 1985).

177 "Instructions for Archaeological Investigations in the U. States" by George Gibbs, SIAR, 1861, pp.392-96 "Suggestions Relative to an Ethnological Map of North America," by Lewis H. Morgan, SIAR, 1861, pp.297-98, and "Instructions Relative to the Ethnology and Philology of America," by George Gibbs, Smithsonian Miscellaneous Collections, 160, (Smithsonian Institution Press, 1863), pp.2-47.

collected for purposes either incompatible with, or entirely unrelated to, their interests and systematic data collection would soon replace the "armchair" anthropologist's reliance on incidental observation of indigenous cultures. The Smithsonian Institution was at the forefront of a movement which would eventually produce trained anthropologists who were capable and eager to conduct their own field studies.[178]

The Smithsonian received invaluable zoological and anthropological collections following the distribution of their pamphlets between 1850 and 1867. These collections were important in their own right, but they were also important as material manifestations of an era. These specimens were collected during a period of expansion at the Smithsonian, and during a period of transition in the history of American science. They were part of the legacy left by the methodological reorientation from serendipitious to systematic data collection that was inseparable from the nineteenth century revolution in the natural sciences. Guidelines had been introduced in an attempt to ensure that all relevant specimens were collected, and the Smithsonian

[178] British anthropologists such as McLennan and Tylor also recognized the limitations associated with serendipitous data collection but the instructions that were published to resolve this situation only appeared in 1874. George Stocking Jr., "The Ethnographer's Magic, Fieldwork in British Anthropology from Tylor to Malinowski," in Observers Observed: Essays on Ethnographic Fieldwork, ed., George Stocking Jr., History of Anthropology, vol.1 (University of Wisconsin Press, 1983), pp.70-120.

advocated the use of prescribed techniques for procuring, conserving and recording data in the field. The scientific community was in the process of redefining specimen collection so as to ensure that specimens fit <u>their</u> needs and <u>their</u> criteria. All field studies would soon conform, theoretically, to the standards set by the scientific community responsible for processing the raw data. The HBC collectors not only participated in this major methodological innovation, they supplied some of the crucially important data that would serve as the material basis upon which the mid-nineteenth century sciences rested.

Chapter III

THE SMITHSONIAN INSTITUTION: ORIGINS & DEVELOPMENT, 1846-1860

The United States assumed an increasingly active role in Arctic exploration after 1850, and while scientific reconnaissance was perhaps a subsidiary component of American exploration generally,[179] it was the primary motivation in the exploratory expeditions sent north by the newly created Smithsonian Institution. Geologists and palaeontologists, botanists and zoologists, classifiers and systematizers, anatomists and physiologists, as well as developmentalists, evolutionists and recapitulationists relied on empirical evidence obtained from collectors in the field, and nowhere held more promise for advance in the life sciences than the northern American continent. North America contained unknown, unidentified, unclassified and uncatalogued specimens of natural history, and it therefore became an immensely attractive and important locus of zoological study during the nineteenth century. Natural history specimens had been sent to Europe since the late

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[179] John Edwards Caswell, "United States Scientific Expeditions to the Arctic, 1850-1909," Ph.D. 1951, Stanford University. William Goetzmann, *Exploration and Empire: The Explorer and the Scientist in the Winning of the American West* (New York: W.W. Norton & Co. Inc., 1966), and *New Land, New Men: America and the Second Great Age of Discovery* (New York: Penguin Books, 1987).

seventeenth century, but they were increasingly collected by North Americans for domestic purposes and, by 1860, the Smithsonian Institution had launched an aggressive assault on the natural and human resources of North America.

The Smithsonian Institution was created by an Act of Congress in 1846, ten years after the United States government had received James Smithson's bequest of $500,000. Smithson was a British subject who had left his legacy to the <u>people</u> of the United States in order that they might benefit from an establishment which was intended to promote the "increase and diffusion of knowledge among men." The Smithsonian Institution was to join existing universities and scientific societies in the acquisition and dissemination of knowledge, and it would eventually achieve Smithson's dreams.

Within twenty years the Smithsonian Institution had become the national repository for natural history collections and the archetypal coordinating agency. But between 1836 and 1846, congressional representatives debated the form and function, as well as the constitutionality of creating a "national" institution.[180] Joel R. Poinsett saw

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180 The best account of the Congressional debates over the creation of the Smithsonian Institution is found in A. Hunter Dupree, <u>Science in the Federal Government: A History of Policies and Activities to 1940</u> (Cambridge: Harvard University Press, Belknap Press,1957), Chapter 4, "The Fulfillment of Smithson's Will, 1829-1861,". See also, Paul H. Oehser, <u>The Smithsonian Institution</u> (New York: Praeger Pubs.,1970); Joel Orosz, "Curators and

the potential of the Institution as a repository for the natural history specimens collected by the "Great United States Exploring Expedition" (1838-42) and the Topographical Engineering Expeditions that were organized while he was Secretary of War, and he was an avid supporter of the Institution. But J.C. Calhoun and W.C. Preston, states rights advocates from South Carolina, opposed the idea that the Smithsonian would be a national university or a national institution of any kind. Furthermore, they advised against accepting the endowment because Smithson was a British subject.

Objections to the Smithsonian endowment waned between 1840 and 1844, and the National Institute was founded. In 1840 the Institute was authorized and federally funded to deal with specimens collected in the northwest, the Antarctic and the South Pacific by Captain Wilkes' Great United States Exploring Expedition. The National Institute was also charged with processing the specimens that had been collected by the Army Corps of Topographical Engineers, but its membership was unable to fulfill either mandate.

The National Institute had been organized along the lines of earlier scientific societies, and it never really overcame the traditional functions and parochial viewpoint

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Culture: An Interpretive History of the Museum Movement in America, 1773-1870," Ph.D. 1986, Case Western Reserve University; and Curtis M. Hinsley Jr., Savages and Scientists: The Smithsonian Institution and the Development of American Anthropology, 1846-1910 (Washington: Smithsonian Institution Press, 1981).

of the scientific society. The National Institute, like the philosophical and scientific societies that had proliferated during the late eighteenth and early nineteenth centuries, lacked the organizational structure, finances and cohesiveness necessary to process the large numbers of specimens entrusted to it.[181] Societies such as the American Philosophical Society of Philadelphia (1769), the Massachusetts Historical Society (1792), the Connecticutt Academy of Arts and Sciences (1799), the American Botanical Society (1806), the Academy of Natural Sciences of Philadelphia (1812), the American Geological Society (1819), the Linnaean Society (1823) and the American Association of Geologists and Naturalists (1840) provided a formalized setting for scientific activities, giving their members a sense of identity, serving as vehicles for entertainment, and facilitating the exchange of ideas and specimens.[182]

The American Association for the Advancement of Science (AAAS) was the first well organized society, and even it could not handle raw data. The AAAS increasingly assumed leadership of the antebellum scientific community, and its membership included those persons who deemed themselves

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[181] A.H. Dupree, <u>Science in the Federal Government</u>, p.71.

[182] Information on the function of scientific societies can be found in T.W. Heyck, <u>The Transformation of Intellectual Life in Victorian England</u> (New York: St. Martin's Press, 1982), pp.57-62, and Richard A. Jarrell, "The Social Functions of the Scientific Society in Nineteenth Century Canada," in <u>Critical Issues in the History of Canadian Science, Technology and Medicine</u>, Jarrell and Arnold E. Roos, eds. (Thornhill & Ottawa: HSTC Publications, 1983), pp.31-44.

capable of judging scientific competency.[183] The AAAS had a general membership which hovered around two thousand and, of that number, approximately one-sixth participated actively as officers or lecturers. Its membership reflected the breadth and diversity of organization found in nineteenth century North American science. All the leading scientists of the 1850s were members of the AAAS and virtually every field of scientific activity found expression in the organization - mathematics and physics, chemistry and mineralogy, natural history, geology and physical geology, mechanical sciences, ethnology and geography, statistics and the many subdivisions within each field. The scientific departments at Yale and Harvard were represented by Asa Gray and Louis Agassiz. Alexander Dallas Bache represented the federally funded Coast Survey. Matthew Maury represented the Naval Observatory, and Joseph Henry and Spencer F. Baird represented the Smithsonian Institution. The scientific and philosophical societies were represented, as were Canadian scientists such as William Logan and J.W. Dawson, thus making the AAAS an unrivalled forum for collegiality.[184]

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[183] For a complete discussion of the AAAS see Sally Gregory Kohlstedt, The Formation of the American Scientific Community: The American Association for the Advancement of Science, 1848-60 (University of Illinois Press, 1976).

[184] The Association represented career scientists in an administrative, professorial or research capacity and "entrepreneurial" scientists, who coveted a permanent, salaried position were also members of the AAAS. Henry, Baird, Agassiz, Benjamin Peirce, Bache, Maury and James Dwight Dana were typical of the active membership of the AAAS. See Kohlstedt, passim. See also S. Zeller, Inventing Canada, for a discussion of Canadian

The National Institute never achieved the cohesiveness of purpose or organization attained by the AAAS, and the AAAS itself succumbed to the pitfalls of sporadic leadership, declining membership and inadequate funding.[185] Neither the AAAS nor the National Institute possessed the institutional framework needed to cope with the large quantity of specimens deposited at the Patent Office before 1857 or at the Smithsonian after 1857.

When debates over the Smithson bequest resumed in 1844, a desire to overcome the structural inadequacies that had characterized the National Institute influenced the terms of the legislation creating the Smithsonian.[186] Two years later (10 August 1846), a Congressional Act established the Smithsonian Institution. Congress therein attempted to resolve the organizational problems which had prevented the National Institute from fulfilling its mandate. It also attempted to come to terms with the jurisdictional problems that had emerged out of congressional attempts to create a scientific organization which was independent from the government, but whose funds were held in trust by a government composed of an executive and two elected bodies.[187]

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scientists and the AAAS meeting that was held in Montreal in 1857, pp.100-101.

[185] Kohlstedt, The Formation of the American Scientific Community, pp.224-33.

[186] Dupree, Science in the Federal Government, p.71 and pp.75-76.

The Act of Organization of the Smithsonian Institution (Statute IX, 102) provided for a Board of Regents as the effective governing body of the Institution. The Board was composed of two executive members, the Vice-President and the Chief Justice, three Senate and three Congressional members, six American citizens, and several ex officio members including the United States President and Secretaries of the Treasury, State, War and Navy.[188] The Regents bore responsibility for the realization of Smithson's instructions, although the Act also provided for the appointment of a permanent, salaried Secretary who would assume responsibility for the actual administration of the legislated programs.

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187 Dupree recognized that attempts were made to improve and specify the relationship between the government and the scientific organizations it created, but he emphasizes the process of reconciliation between the various groups involved, not the fact that the government was supervising rather than initiating the creation of the Institution. Joseph Henry, the first Secretary of the Institution, pointed out this relationship and took issue with those who considered the Smithsonian to be a "national" institution. See A. Hunter Dupree, _Science in the Federal Government_, p.77. and Joseph Henry's "Programme of Organization for the Smithsonian Institution," in William J. Rhees, ed., _The Smithsonian Institution: Documents Relative to its Origin and History_, Smithsonian _Miscellaneous Collections_, vol. 17 (Washington: Smithsonian Institution, 1879), p.944.

188 Copy of an "Act to Establish the Smithsonian Institution" and copy of an "Act to Establish the Smithsonian Institution, Revised Statutes" in William J. Rhees, (ed.), _The Smithsonian Institution: Journals of the Board of Regents, Reports of Committees, Statistics, etc._, Smithsonian _Miscellaneous Collections_, 329 (Washington: Smithsonian Institution Press, 1879), pp.753-768. Revised Act is also found in W.J. Rhees, (ed.), _The Smithsonian Institution: Documents Relative_

Joseph Henry, a renowned physicist and professor of natural philosophy at Princeton University, was appointed the first permanent Secretary of the Smithsonian. Henry was an authority on electricity and magnetism and he independently discovered the law of electromagnetic induction, which was officially attributed to Michael Faraday. He had clearly defined priorities when it came to scientific matters, and his biases in favour of research and original publications were both well known and acceptable to those who had supported his nomination for Secretary.[189] Alexander Bache, (who was one of the first Regents of the Institution) Michael Faraday and Benjamin Silliman were not only Henry's colleagues and friends. All three placed their considerable reputations behind Henry's nomination.

The brevity of the clause in Smithson's Will dedicated to the creation of the Institution and the comprehensive, yet vague, instructions given in the Act of Organization permitted Henry and the Regents to "... mold the Institution's very nature without leaving the laws behind."[190] Henry was convinced that the "increase of knowledge," particularly through original research, was the primary purpose of the Smithsonian Institution. He viewed the "diffusion of knowledge" as supplementary to the

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to its Origin and History, 1835-1899, Smithsonian Miscellaneous Collections, vol.42 (Washington: Smithsonian Institution, 1901), pp.xxi-xxvi.

[189] Orosz, "Curators and Culture," p.271.

[190] Dupree, Science in the Federal Government, p.79.

increase, and he strongly resisted claims that the Institution should disseminate popular information. He chastised those who supported the appropriation of the Smithson monies for popular education, or for the purchase or accumulation of books, art or natural history specimens already possessed by other American libraries or museums. He stated that persons who supported such ideas had an "imperfect apprehension of the terms of the Will."[191]

In 1847 Henry provided the Board of Regents with a detailed essay of his vision of the Smithsonian.[192] He perceived scientific activity as a search for truth which transcended political boundaries, and this ideal was referred to repeatedly throughout his proposed "Programme of Organization of the Smithsonian Institution." He rejected the notion that the Smithsonian was a national organization on the basis that it was "... the establishment of an individual, and is to bear and perpetuate his name."[193] The American government was merely the trustee of Smithson's endowment. The Institution was not funded by the government, and appropriately so, Henry thought.

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191 SIAR, 1851, pp.6-7.

192 The Smithsonian Institution: Documents Relative to its Origin and History, W.J. Rhees, ed., Smithsonian Miscellaneous Collections, Vol. 17, 1879, pp.944- 958.

193 Ibid., p.944.

Henry submitted two proposals to facilitate the increase of knowledge. He suggested that the Smithsonian recognize contributions in original research through monetary reward or decorative honours and that the Institution publish, free of charge, the results of original researches. Secondarily, he suggested that Smithsonian monies be set aside to fund special projects such as meteorological observations, North American explorations or ethnological research. He only reluctantly incorporated Congressional aspirations for a library, a museum and an art gallery within his "Programme," and did so only out of deference to the government's role in the creation of the Institution.

Henry's views on the diffusion of knowledge were also expressed in his "Programme." The Press, he stated, was the most efficient means of disseminating knowledge, but the Smithsonian should limit itself to the spread of new knowledge. Henry extolled the virtues of refereed journalism, but he stipulated that only original research, conforming to the constraints established by verifiable hypotheses, experiment and observation merited publication. He believed that few persons were qualified or capable of "discovering scientific principle," but he felt that the Smithsonian should publish articles containing new knowledge, if their authors lacked the finances necessary to print their researches. He therefore proposed that the Smithsonian publish a series of periodicals modelled after the annual report published by the Swedish Academy. Henry proposed that the essays included in the Smithsonian Institution Annual Report not only fulfill scholarly criteria but appeal to the "general reader," and he assumed that this standard of excellence could be achieved if "... the preparation of these reports should be intrusted only to persons profoundly acquainted with the subjects to which they relate -"[194] He suggested that the Smithsonian editors adopt the same strategy with regard to the two other proposed publications -- the "brief treatises on particular subjects," which soon materialized as the Smithsonian Contributions to Knowledge and the Smithsonian Miscellaneous Collections. Henry readily agreed that the Smithsonian should publish "new" knowledge, but he rejected opinions that the Smithsonian had an obligation to support the popularization of science. He opposed the allocation of funds to support a lecture series, or in order to offer the public access to general knowledge available elsewhere.

Henry's preoccupation with the Institution's finances was legitimate. Its funding was undeniably inadequate for his vision. The Smithsonian had an annual income of $30,000, fixed by its endowment. This was considerably less than the federally funded United States Coast Survey, which in 1854

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[194] Henry outlined his vision for scientific publication at the Smithsonian in his "Proposed Application of Smithson's Bequest." See, The Smithsonian Institution: Documents Relative to Its Origin and History, William J. Rhees, ed., Smithsonian Miscellaneous Collections, vol.17 (Washington: 1879), pp.951-957. See p.956 for quotation.

had a budget of $489,000.[195] Moreover, the Institution only received Congressional funding after specimens that had been collected by government expeditions were transferred from the Patent Office to the Smithsonian in 1858.[196] The Smithsonian thereafter received an annual appropriation of $4000, with the exception of one year in which Congress granted the Institution $10,000. The annual appropriation never reached $20,000 until 1870, and by then the Smithsonian collections were commonly referred to as the "National Museum."[197] In 1880, $136,000 was appropriated by Congress for the care and maintenance of the government collections, and for the care of the articles which had been transferred from the Centennial Exhibition at Philadelphia.[198] But until 1870 public funding was minimal, and only provided for the care of government collections.

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[195] With this fact in mind, A. Hunter Dupree judges Henry's "Programme" and his accomplishments very favourably. Science in the Federal Government, pp.86-87.

[196] Letter from S.F. Baird to J. Henry, 1876, reprinted in W.J. Rhees, ed., The Smithsonian Institution: Documents Relative to its Origin and History, 1835-1899, Smithsonian Miscellaneous Collection, vol. 42 (Washington, 1900), p.760.

[197] See Appendix 1 for details of Congressional appropriations to the Smithsonian, 1858-1879.

[198] Some of these monies were designated for building improvements such as steam heating, water and sewer, gas fixtures and electricity. Stat.,XXI, 272 and Stat.,XXI, 276 (16 June 1880), in Rhees, The Smithsonian Institution: Documents Relative to its Origin and History, 1835-1899, Smithsonian Miscellaneous Collections, vol.42, p.841. This figure does not include monies appropriated to cover the costs of transporting the collections from Philadelphia to Washington. Congress allocated an additional $21,000 for that purpose. Stat.,XIX, p.45 (1 May 1876), Ibid., p.745.

The Institution financed its library, museum, research, publication, exchange and exploration programs with the interest from its original endowment, or with monies from philanthropic sources.

In 1845 Congress had stipulated that as much as $25,000 annually might be spent on library accessions.[199] Henry rejected that policy outright. He felt that the Smithsonian's meagre budget could not sustain serious scientific research as well as a library. He maintained that neither the original endowment nor the accrued interest could finance a library containing general holdings. He suggested that the Smithsonian collect "... the transactions and proceedings of all the learned societies in the world [and] ... the more important current periodical publications, and other works necessary in preparing the periodical reports."[200] Henry also suggested that the library contain catalogues rather than volumes. He recommended the preparation of one catalogue to describe the holdings of American libraries, and another to describe foreign holdings. The first would ensure that Smithsonian purchases would be limited to books unavailable elsewhere in the United States, and the second would enable researchers to determine the whereabouts of publications on the latest

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[199] Dupree, Science in the Federal Government, p.78.

[200] Joseph Henry, "Programme of Organization of the Smithsonian Institution, The Smithsonian Institution: Documents Relative to its Origin and History, W.J. Rhees, ed., Smithsonian Miscellaneous Collections, Vol. 17, p.947.

scientific advances. Henry was, in essence, proposing that the Smithsonian establish a reference library rather than a lending library.

In 1847 the Board reassessed its previous generosity towards the library and divided the Smithsonian's annual income so that the museum and library together received one half ($15,000), with the other half going to Henry's program.[201] Charles C. Jewett, who had been hired that same year as the Assistant Secretary and Librarian of the Institution disagreed, perhaps quite justifiably, with Henry's view that the library should contain mainly bibliographic material. The Regents, specifically Rufus Choate, George P. Marsh and Robert Dale Owen, the government representatives on the Board, had endorsed the library and museum programs. Jewett therefore felt secure in stating that the library should contain "... nearly all the publications of importance issued from the American press."[202]

Resistance to the development of a museum and library had influenced Henry's administrative policies from the beginning. Henry purposefully prolonged construction in order to delay the opening of a "suitable building" in which

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[201] The Henry-Jewett dispute is discussed by Dupree, Science in the Federal Government, pp.83-85.

[202] Appendix 1. "Extract of a Communication of Professor Jewett, Assistant Secretary of the Institution, acting as Librarian" attached to Henry's "Programme" in Rhees, (ed.), Smithsonian Miscellaneous Collections, Vol. 17, 1879, p.959.

the collections, the library, the lecture rooms and the art gallery could be housed.[203] Henry was also able to divert unused building funds into research and publications by spreading the construction over seven years, rather than completing the building in the two to three years it should have taken.[204] Once the building was finished, however, Henry had to face his competitors. Finally, in 1854, he openly criticized the division of funds made by the Regents in 1847. When the Regents agreed with Henry's assessment, Jewett appealed to Congress. Henry retaliated by dismissing Jewett, and twelve years later Henry rid himself of Jewett's books when they were transferred to the newly created Library of Congress.

Doing battle with those who supported the popularization and diffusion of knowledge consumed much of Henry's time, but he could not hold the "diffusers" at bay indefinitely. In 1850 Louis Agassiz, a bona fide scientist, supported the museum lobby's claim that a museum must open, and the lobby soon persuaded the Regents of the validity of their arguments.[205] Moreover, Agassiz felt that the Smithsonian should encourage "real science." Comparative anatomy and

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[203] Howard Miller, Dollars for Research: Science and Its Patrons in Nineteenth-Century America (Seattle: University of Washington Press, 1970), p.19.

[204] Ibid.

[205] See Orosz, "The Ideal of Professionalism: The Academy of Natural Sciences, The Wadsworth Atheneum and the Smithsonian Institution," Chapter 12 in "Curators and Culture."

physiological studies could be fostered through a museum program which had large natural history collections, and Agassiz appealed eloquently to the Regent's desire for international recognition as a reputable scientific organization.[206]

The Regents had, however, more difficulty in persuading Henry of the value of a museum than the museum lobby had had in convincing the Regents of the necessity of opening the museum. In the end, Henry really had no choice but to act on the Regents' decision, but he complied only reluctantly. He deferred the opening of a public museum for ten years, and he argued that the museum, like the library, should consist of collections not found elsewhere in America. The uniqueness of these collections would, he reasoned, permit "original" research but avoid an unnecessary and expensive duplication of the services already provided by numerous other museums.[207]

Until 1860 specimens were used strictly in accordance with Henry's wishes. They were made available, theoretically, to any and all scholars who had the "knowledge and skill necessary to the prosecution of

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[206] "Communication from Professor Agassiz, relative to the formation of a Museum," SIAR, 1849, p.26.

[207] See Curtis Hinsley for a recent revision and more sympathetic interpretation of Henry's anti-museum stance. Henry wanted the Smithsonian collections to have a bona fide scientific purpose. He deplored the notion of a museum as a chaotic collection of "curiosities." Savages and Scientists, pp.64-65.

researches." Henry was as opposed to the idea of the museum as an enclave of the elite (meaning private members or associates of the Institution), as he was to the idea of spending funds on a public museum, particularly one containing general collections.[208] Henry subscribed to the view that American museums " ... consisted of spectacular or bizarre objects with no scientific or educational value; [being] sideshows aimed at public gratification."[209] Therefore, when the Regents decreed that he must establish a museum at the Smithsonian, Henry was less than enthusiastic about the project and strove to ensure that the Museum's collections were limited, coherent, and assembled without taxing the Institution's funds.

Henry's stance was, in part, what separated the Smithsonian Museum from its predecessors. When the Smithsonian Museum finally became operational during the 1850s it departed from past practices regarding the relationship between museums, science and society. Prior to the emergence of the Smithsonian museums were identified with one of three major objectives. They were first conceived as tools of social control (1800-20), becoming centres of self-education (1820-40),and finally centres of scholarly research (1840-50). However the Smithsonian Museum strove to combine both scholarly research and popular

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[208] "Secretary's Report," SIAR, 1856, (Washington, 1857), p.43.

[209] Orosz, "Curators and Culture," p.2.

education, thus characterizing the development of the modern museum (1850-70).[210]

Different perceptions of what were virtually the same objects accompanied the functional bases of nineteenth century museology, and the terminology that was applied to anthropological collections is especially indicative of cognitive changes. The "artificial curiosities" of the eighteenth century became the "curios" or "relics" found in the cabinets of the early nineteenth century.[211] These same articles were perceived as "artifacts" or "specimens," having considerable historical and scientific significance to earnest researchers in the second half of the nineteenth century, as did well-preserved zoological specimens.

The scientific merit of the Smithsonian collections was important to Henry, but his lament over the "loss" of funds to the museum and library was incessant. He resisted opening the museum even though the museum, library and art gallery received an allocation equal to only two-thirds that given Henry's projects.[212] Consequently, the Smithsonian Museum consisted of natural history specimens contained in crates,

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[210] Joel Orosz, "Curators and Culture," pp.4-10.

[211] Douglas Cole, Captured Heritage: The Scramble for Northwest Coast Artifacts (Vancouver: Douglas & McIntyre Ltd., 1985), pp.281-282 and p.xxx.

[212] Smithsonian expeditures were usually included with each Annual Report. See the following for information on the funding of the Programs: SIAR, 1854, pp.60-61 (for a general statement of expeditures for the years 1847-54); 1855, pp.67-69; 1856, pp.78-83; 1857, pp.66-70; 1858, pp.74-75; 1859, pp.97-98, and 1860, pp.74-75.

boxes, barrels and jars, confined to the basement of the unfinished building.[213] After 1853 additional space was required to accommodate the huge numbers of specimens coming in from both private collectors and government expeditions, and the collections were then distributed throughout the building.[214] Construction on the new building was completed in 1855 and although the museum had been promised space in the main hall of the building, proper display cabinets and furnishings were not provided until 1858, thus delaying the official opening until 1860.[215] The public was then finally admitted to view a small sampling of the Smithsonian collections which, by 1860, had exceeded 55,000 specimens.[216]

In addition to insisting that Henry open the Museum, the Regents authorized the hiring of an Assistant Secretary to supervise the collections. Henry's choice for Assistant Secretary was Spencer Fullerton Baird, a medical student

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[213] SIAR, 1851, p.22.

[214] "Reports" of the Secretary and Assistant Secretary, Smithsonian Institution Annual Report, 1850-53.

[215] SIAR, 1855, pp.14-15 1858, pp.14-15 and 1860, p.74.

[216] The Museum had received 55,389 specimens by the end of 1860, SIAR, 1861, p.64. Many specimens had been received from the Patent Office in 1858, including those specimens collected by the several branches of the United States Exploring Expedition (1838- 41). These specimens were transferred to the Smithsonian by an Act of Congress in 1858 (Stat.,XI, 219) 3 March 1857, in William Rhees, ed., The Smithsonian Institution: Documents Relative to its Origin and History, Smithsonian Miscellaneous Collections, vol.17 (Washington, D.C.: Smithsonian Press, 1879), p.603.

turned naturalist.[217] Henry had deliberately chosen Baird over Titian Peale. Peale had some claim to the position since he was familiar with the government collections through his experience as an Examiner in the Patent Office,[218] but Baird had a reputation as a serious collector. Baird was primarily interested in ornithology and herpetology, but he kept abreast of virtually every field of natural history. He also studied languages, literature, philosophy, mathematics, chemistry and physics. Moreover, while he was collecting specimens for his personal cabinet, he was also cultivating friendships within the American scientific community. Consequently, in 1847 when James Dwight Dana suggested to Baird that he apply for a position with the Smithsonian, a number of his friends and colleagues also supported the nomination. Baird, then a professor of Natural History at Dickinson College, petitioned Henry for a position at the Institution and his application was supported by Audubon, John Cassin and Thomas Mayo Brewer. His application was also supported by Congressman George P. Marsh and Assistant Secretary Jewett.

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[217] Biographical information on Baird is from William A. Deiss, "The Making of a Naturalist: Spencer F. Baird, The Early Years," in From Linnaeus to Darwin: Commentaries on the History of Biology and Geology (London: Society for the History of Natural History, 1985), pp.141-148.

[218] Orosz, "Curators and Culture," p.278.

Baird's inclination for collecting objects relevant to serious scientific study was one of the reasons Henry chose him as Assistant Secretary. But while Baird was sympathetic to Henry's derision of the exotic, queer and marvelous, he disagreed with his superior's assessment that the Smithsonian collections should only contain specimens unavailable elsewhere in America. And by 1854, Baird had converted Henry from a reluctant endorsement of a museum, to the opinion that the Smithsonian should strive to acquire a complete collection of North American zoological specimens.[219] He had persuaded Henry of the validity of Agassiz's argument, an argument which the Secretary had previously either rejected or ignored, and Henry thereafter accepted Baird's definition of general collections as global. He also agreed with Baird's claim that unlimited quantities of identical specimens were necessary, and acquiescence evolved into encouragement. Henry justified the funnelling of duplicates through the Smithsonian to both domestic and foreign societies and institutions, as a means of "diffusing knowledge."[220] Specimen exchange was certainly cheaper than the construction and maintenance of a public museum, especially since the Smithsonian was supposed to facilitate, rather than actually prosecute the exchanges.[221] Most important, specimen exchange elevated the Smithsonian's

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[219] "Secretary's Report," SIAR, 1854, p.25.

[220] SIAR, 1858, p.15.

[221] SIAR, 1854, p.42.

profile within the scientific community, without adding any expense to a small and overtaxed operating budget.

Henry's fears that the Institution would degenerate into a side show once the museum opened were unfounded. The museum and natural history department stayed well within nineteenth century standards of scientific excellence while under Baird's care, and they conformed to Henry's philosophy of science even after the museum was opened to the public. He was unequivocal in his assessment of the different functions of the museum and natural history department. The museum was the Smithsonian's only link with the public and it was, Henry stated, intended for the " ... gratification and incidental instruction of the visitors to the city of Washington."[222]

The objectives of the natural history department would, however, more accurately reflect the standards which Henry had set for the Institution. This department was to be the epitome of legitimate scientific activity. It would conform to scientific principles and the large numbers of duplicate specimens deposited with the natural history department would " ... advance science by furnishing to original investigators, wherever they may reside, new materials for critical study; and ... diffuse knowledge by providing colleges, academies, and other educational establishments with the labelled specimens necessary to give definite ideas

[222] SIAR, 1862, p.34.

of the relations and diversities of the various productions of nature."[223] Under the guidance of Henry and Baird, the museum and natural history department were important components of contemporary perceptions of the Smithsonian as the symbol of science in America.[224] Even though Smithsonian funding never equalled that given the federally financed surveys or exploring expeditions, it was the most important scientific organization in antebellum America.[225]

Limited financial resources initially retarded the fulfillment of Henry's dream that the Institution function as a "seedbed of science," but the programs established by Henry and Baird nevertheless set a precedent for future scientific development. Research became a primary goal rather than a subsidiary activity of government and private enterprise.[226] The programs initiated and administered by

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[223] Ibid.

[224] While Nathan Reingold's assessment of the Smithsonian Museum as the "nation's attic" is undeniably correct for a later period in the Institution's history, the earlier history of the museum and natural history department is not so clear cut. The processes of collection, preservation, identification and classification of zoological, botanical, geological and ethnological specimens were as inseparable from contemporary perceptions of the Smithsonian as the symbol of science in America, as were the laboratory experiments or the prestigious publications of the Institution. See Nathan Reingold, Science in Nineteenth-Century America: A Documentary History, American Historical Series (New York: Hill and Wang, 1964), p.153.

[225] Robert Bruce, The Launching of Modern American Science, 1846-1876, The Civil War Centennial Commission Series, ed., Harold M. Hyman (New York: Alfred A. Knopf Inc., 1987). See Chapter 14, "The Smithsonian, Seedbed of Science," pp.187-200.

Henry and Baird were as important to the future development of American science, as was the tendency towards direct government financial assistance that was established when government monies accompanied the Patent Office specimens transferred to the Smithsonian in 1858.

Under Baird's direction the museum and natural history department not only reflected a commitment to the scientific principles that Henry had insisted must be associated with the Institution, but exemplified the acquisitive tendencies that typified the nineteenth century museum community.[227] Baird was one of the most successful curatorial and accessions administrators of his day.[228] He was driven by a desire to establish the most complete natural history collection on the continent[229] and, to the extent that he

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226 Ibid., p.199.

227 See James Clifford, "Objects and Selves -- An Afterword," in Objects and Others, ed., George W. Stocking Jr., pp.236-246, for a discussion of collections as representative of capitalist accumulative ethos, and as illustrative of the values of collectors and scientists.

228 Both Baird and Henry fall, to some extent, under Nathan Reingold's definition of the scientist-administrator. He states: "Succeeding the scientist-entrepreneur was the scientist-administrator, sometimes an active investigator but usually an intermediary between the researcher and those holding the power of the purse." Science in Nineteenth-Century America: A Documentary History, p.31.

229 See Doug Cole's analysis of Baird's drive to get northwest anthropological specimens, and his resentment at any "losses" to his competitors, in Chapter 1, "Secretary Baird and Judge Swan Build a Collection," Captured Heritage: The Scramble for Northwest Coast Artifacts, pp.9-47. See also the Smithsonian Institution Archives, the Hudson's Bay Correspondence

was successful, these collections formed the empirical basis which effectively transformed the Smithsonian from a fledgling scientific organization into the preeminent American institution of scientific study and public education.[230] The Smithsonian was at the forefront of the collecting mania which swept through the nineteenth century scientific community and, as early as 1855, both Henry and Baird were claiming that their Institution had the biggest and the best collection of North American natural history specimens:

> ... on the authority of Professor Baird, corroborated by the opinion of others well qualified to judge, that no collection of animals in the United States, nor, indeed, in the world, can even now pretend to rival the richness of the museum of the Smithsonian Institution in specimens which tend to illustrate the natural history of the continent of North America.[231]

Baird himself was personally responsible for a large percentage of the Smithsonian collection since he had generously donated his private cabinet of natural history specimens when he joined the Institution. His mammal, bird, reptile, fish and fossil specimens filled two boxcars and they established the form and substance of the long

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Collection and Correspondence of Assistant Secretary Baird, 1850-77, Record Units 52 and 53. Other references to Baird's collecting predisposition are found in the Smithsonian Annual Report and W.A. Deiss discusses Baird's collecting habits in "Spencer F. Baird and his collectors."

230 Robert V. Bruce, The Launching of Modern American Science, 1846-1876, Chapter 14, "The Smithsonian, Seedbed of Science," pp.187-199.

231 SIAR, 1855, p.31.

postponed museum.[232]

Accumulative tendencies were strong but neither Henry or Baird were satisfied to receive large quantities of poor quality specimens. Properly preserved specimens were as essential to morphological identifications as they were to museum displays, and institutional pride could not condone second rate efforts. The Smithsonian programs embodied the aims of serious scientists and even the museum program avoided pandering to dilettantes who lacked purpose, training or conviction in their collecting activities.

Collecting and processing specimens was, in Baird's opinion, a most serious undertaking. Once established at the Smithsonian he prepared a pamphlet on the "Directions for Collecting, Preserving and Transporting Specimens of Natural History," that left nothing to chance.[233] Lists of apparatus and preservatives were accompanied by detailed instructions for wet and dry methods of preservation. He itemized the types of data which should accompany each specimen to facilitate their study by naturalists when they were

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[232] William A. Deiss, "Spencer F. Baird and his collectors," Journal of the Society for the Bibliography of Natural History, (1980)9(4):637.

[233] This pamphlet was initially prepared during 1850 (SIAR, 1851, p.50) and issued in the Spring of 1851 (SIAR, 1851, Washington, 1852, p.45). After that its contents were expanded and a letter dated 17 January 1852, from the Secretary of War was attached. In that letter the Secretary granted Smithsonian collectors free transportation for their specimens. A copy of the expanded circular is found in the Smithsonian Miscellaneous Collection, 34 (Washington: Smithsonian Institution, 1859), pp.2-40.

received at the Smithsonian, and he described techniques applicable to specific groups of specimens. The vertebrates were distinguished from the invertebrates and instructions for the skinning and stuffing of birds, mammals, fishes and reptiles were accompanied by notes on the apparatus and procedures applicable to the collection and preparation of microscopic organisms, embryos, nests, eggs, skeletons and plants. Moreover, since specimens were often very delicate and had to travel many miles before arriving at the Smithsonian, he included detailed instructions for their packing and shipping.

Baird's instructions were particularly important in order to prevent the arrival of cases filled with broken vials, wet notes, and damaged specimens, but they were also crucial determinants of the composition of the Smithsonian's natural history collections. The Smithsonian had benefited from the efforts of independent collectors such as the Reverend Dr. Gurley (West Africa, 1846-57), the Reverend C.W. Dennison (British Guiana, 1842-57), William Stimpson (New England Coast, 1850), Thaddeus Culbertson (Upper Missouri, 1850), Dr. E.K. Kane (North Greenland), A.J. Vaughan (Upper Missouri, 1854-55), Dr. P.R. Hoy (Wisconsin and Missouri, 1854), Robert Kennicott (Illinois, Minnesota and Winnipeg, [sic] 1854-57), Reverend A.C. Barry (Wisconsin, 1854), E. Samuels (California, 1855-56), Donald Gunn (Red River Settlement, 1857), John Xantus (Fort Riley, Kansas and Fort

Tejon, California, 1857-58), Thomas Blakiston (The Saskatchewan, 1858), Dr. F.V. Hayden and Professor F.B. Meek (Kansas, 1858) and Dr. F.V. Hayden (New Jersey, 1858).[234] Baird himself had gone into the field and collected specimens in Wisconsin, Illinois and Ohio (1853), and along the coast of New Jersey (1855), but his "Directions" were formally sent with the scientific teams attached to the seven different Pacific Railroad Survey Expeditions dispatched by the War Department between 1853 and 1855.[235] The Institution eventually received the specimens collected by Governor I.I. Stevens (survey of the forty-seventh parallel), Lieutenant R.S. Williamson (California railway survey), Captains Gunnison and Beckwith (survey of the thirty-eighth, thirty-nineth and forty-first parallels), Captain Whipple (survey of the thirty-fifth parallel), Lieutenant J.G. Parke (survey of western end of the thirty-second parallel), Captain J. Pope (survey of eastern end of thirty-second parallel) and Lieutenant R.S. Williamson (survey in California and Oregon), and these specimens provided information about the west that had been lost through careless treatment of the specimens collected by the Wilkes Expedition.[236] Many of the approximately 160,000

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[234] See, "Report of Assistant Secretary, Increase of the Museum," SIAR, 1854-59, and see also "List of the more important explorations and expeditions, the collections of which have constituted the principal sources of supply to the National Museum, with indication of the department of the government under which prosecuted," SIAR, 1877, pp.105-115.

[235] Bruce, The Launching of Modern American Science, p.205.

Wilkes specimens deposited at the Patent Office and placed in the care of the National Institute never arrived at the Smithsonian Institution, when they were transferred from the Patent Office in 1858.[237]

In 1857, the Smithsonian Institution became the official repository of specimens collected under the auspices of the military branch of the government. The natural history specimens that had been deposited with the Patent Office, given to the care of the incompetent National Institute, and then passed on to the Smithsonian in 1858 by Congress, joined collections which had been sent directly from government expeditions to the Smithsonian.[238] The Institution had already received specimens from the departments of War, Army, Navy and the Interior, the U.S. Coast Survey, the Land Office and the Mexican Boundary Commission, in addition to specimens collected by the Pacific Railroad Survey Expedition in 1854.[239] After 1857, all natural history and ethnographic specimens collected by

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[236] Details of the Pacific Railroad Surveys obtained from "Appendix to Report of the Secretary," SIAR, 1877, p.106.

[237] William Goetzmann, New Lands, New Men, p.288.

[238] Act passed by Congress in 1858 (Stat.,XI, 219) 3 March 1857, in Rhees, ed., The Smithsonian Institution: Documents Relative to its Origin and History, Smithsonian Miscellaneous Collections, vol.17 (Washington, D.C.: 1879), p.603. See also "Report of the Assistant Secretary," SIAR, 1858, regarding the delay of their transfer to the Smithsonian. Cases were not ready for the specimens until 1858, and the last of them arrived in July 1858.

[239] SIAR, 1854, p.37.

government expeditions went directly to the Smithsonian for identification and disposition.[240]

The majority of the Institution's natural history and ethnographic specimens had, until 1859, been collected by persons attached to the forty-five expeditions dispatched by the government, but Baird also undertook the establishment of a self-sustaining exploration program. He fortuitously took the first tentative steps towards the creation and development of a independent exploration program just two years before the States separated into armed camps. Between 1861 and 1866, the Smithsonian's natural history department did not receive any specimens from an obviously preoccupied military.[241] Baird's Exploration Program was crucial to the steady, and even remarkable gains made in the Smithsonian collections during the war years.

Baird's initiatives also represented an effort to rationalize the informal and ad hoc sponsorship that had been relied upon and, in 1858, the Smithsonian sponsored scientific expeditions to the American west, Rocky Mountains and Pacific Coast.[242] Explorations in Mexico, Guatemala, Ecuador, Costa Rica, the West Indian islands of Trinidad, Jamaica and Cuba, to the shores of South America, and in the Mackenzie River District of the Hudson's Bay Company's

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[240] "Report of the Secretary," SIAR, 1858, p.40.

[241] SIAR, 1867, pp.76-78.

[242] SIAR, 1858, pp.51-52.

northern territories were also sponsored throughout the following decade.[243] The Smithsonian collections virtually doubled regardless of the withdrawal of government support. Antebellum accessions had equalled 55,389 by 1860 but, by 1866, the Smithsonian collections had exceeded 119,000.[244]

Under Baird's supervision, the Exploration Program quickly began to demonstrate its viability as a method of obtaining specimens. While the American Republic was preoccupied with wartime politics, military strategum and reconstruction, American scientists assumed responsibility for functions previously exercised by government departments, and the Smithsonian scientists concentrated on establishing their Institution as the preeminent repository and research facility in North America.[245] Field naturalists

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243 SIAR, 1860-70.

244 The Smithsonian Annual Reports enumerated cumulative accessions periodically. The first attempt to statistically analyze their collections was made in 1858, but a numerical breakdown of their collections appeared every second year for the next twenty years. The total number of specimens registered at the Smithsonian follows the date, however, the source of this data may not always come from that year's report: 1851, 911; 1852, 1188; 1853, 1388; 1854, 4979; 1855, 7675; 1856, 11222; 1857, 16158; 1858, 25506; 1859, 37197; 1860, 55389; 1861, 66075; 1862, 74764; 1863, 85726; 1864, 95922; 1865, 111847; 1866, 119101. This information has been derived from the following Annual Reports: 1858, p.57 1860, p.73; 1862, p.57; 1864, p.84; 1865, p.84; and, 1866, p.45.

245 George Daniels contends that the Civil War allowed scientists to wrest control of American science from politicians, who were otherwise occupied. Science in American Society: A Social History, pp.267-269. and Robert V. Bruce's examination of the Smithsonian Institution during the war years tends to support Daniel's thesis. Chapter 14 "The Smithsonian

were crucial to such aspirations. They were expected to deliver the data necessary to realize the Smithsonian's mission, and in 1859-60 Robert Kennicott and Constantin Drexler went north. They were charged with recruiting the volunteer collectors and with collecting the specimens that would extend empirical knowledge, and that would ultimately be necessary for the institutional repute coveted by Smithsonian scientists.

Institution, 'Seedbed of Science,'" The Launching of Modern American Science, pp.187-199.

Chapter IV

RECONNAISSANCE IN RUPERT'S LAND: SPECIMENS & THE SMITHSONIAN

By 1850 Spencer Baird had become only too aware of the shortcomings of existing data on North American zoology. A survey of the state of North American natural history revealed many private and public collections rich in mammals, birds and mollusks, but there were disproportionately fewer collections in which reptiles, amphibians, crustaceans, insects (excluding coleoptera and lepidoptera), fishes, worms, radiata, invertebrates, algae and other marine life were represented adequately.[246] Moreover, Baird was acutely aware of the fact that collections of northern zoological specimens were even less well developed than collections of temperate specimens. References to northern specimens had been included in the scientific literature since the mid-eighteenth century, but the available information on specifically North American specimens was sparse.

The Royal Society and the British Museum had received specimens through the HBC, as had the Montreal Natural History Society, and the University of Edinburgh, but there

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[246] SIAR, 1850, pp.46-48.

were only small numbers of northern specimens in each case. Specimens collected by John Rae's expedition of 1846-49 had survived in the British Museum, but many specimens collected only thirty years earlier at York Factory by John Franklin and Joseph Sabine had been lost or destroyed.[247] Overseas Governor George Simpson had established a private natural history museum at his home in Lachine, although it is uncertain that he had collected to any great extent before 1850.[248] The Smithsonian received its first northern specimens in 1856, and the natural history specimens brought back by the Ringgold and Rodger's expedition hinted at the potential of the north for natural history collections and research.[249] The Smithsonian also received specimens collected along the southern border of present-day British Columbia by Dr. C.B. Kennerly, naturalist, and George Gibbs, geologist, while they were employed by the Northwestern Boundary Survey Commission (1857-1859).[250] And John Gould, a renowned British ornithologist, sent approximately one hundred and fifty avian specimens from the cabinets of the

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[247] Edward A. Preble, "A Biological Investigation of the Hudson Bay Region," North American Fauna, no.22, Department of Agriculture, Division of Biological Survey (Washington: Government Printing Office, 1902), pp.24-26.

[248] Susan Stewart, "George Simpson: Collector," The Beaver, Summer, 1982, pp.4-9. Note: the Royal Industrial Museum of Scotland originated in 1854, and so no specimens obviously went there before 1850.

[249] SIAR, 1856, p.53.

[250] SIAR, 1857, p.46 1858, p.50 and 1859, p.64.

British Museum.[251] A portion of the British donation consisted of Arctic specimens, presumably culled from the series of specimens that had been collected by Sir John Richardson, and then later deposited in the British Museum by Joseph Sabine.[252] The empirical basis of northern natural history was almost non-existent, although collections had been shipped out sporadically for at least a century.

Baird had originally proposed the compilation of identification lists or Catalogues, in order to facilitate field identifications and collection of the much needed northern specimens. A review of the literature on North American zoology had reinforced Baird's assessment of the need to extend the empirical base of the North American life sciences. There had been only four major publications on northern North American fauna printed in the previous one hundred years, although there were numerous subsidiary

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[251] Gould (1804-1881) was an ornithologist and taxidermist to the British Zoological Society, and a Fellow of the Royal Society. He published 41 folios on birds, with 2,999 illustrations, and these works included: A Century of Birds from the Himalayan Mountains,(1832) Birds of Europe, (1832-37) Birds of Austrailia, (1840-48) and supplement, (1851-69); Birds of Asia, (1850-80) and Birds of Great Britain, (1862-73). See: The Dictionary of National Biography, The Concise Dictionary, Part I, From the Beginnings to 1900, (Oxford University Press, 1961) for biographicl information on Gould (p.518), and see the Smithsonian Annual Report, 1857, p.48 for details of the British donation to the American museum.

[252] See C. Stuart Houston for details of Sabine's involvement in the disposition of Richardson's ornithological specimens. Sabine was noteworthy for his position as the honorary Secretary of the Horticultural Society. Arctic Ordeal, p.198.

sources containing information on Arctic zoology.[253] George Edward's Natural History of Uncommon Birds (1751) was the first important publication containing information on northern North American species, while John R. Forster's A Catalogue of the Animals of North America (1771) and Thomas Pennant's Arctic Zoology both included descriptions of northern North American specimens. But the authoritative work on Arctic zoology was Fauna Boreali-Americana (1831).

Fauna Boreali-Americana did not, however, include data on the animal species inhabiting the Upper Yukon, the Arctic coast or the more southerly regions around Great Slave Lake.[254] And the empirical lacunae became even more obvious as Baird examined indigenous zoological publications. John Lawson's Description and Natural History of North Carolina (1700-30) and Mark Catesby's The Natural History of Carolina, Florida, etc. (1731, 1743, 1748), were amongst the first publications to appear on North American zoology, but the appearance of the first volume of Alexander Wilson's American Ornithology or, the Natural History of the Birds of the United States (1808) initiated the first truly productive period in North American ornithology. Wilson's work contained decriptions and illustrations of approximately two hundred and eighty species. Wilson died before his masterwork was completed, but his associate

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[253] See Appendix A1 for a bibliography of these sources.

[254] S.F. Baird, T.M. Brewer and R. Ridgway, "Preface," History of North American Birds, Land Birds (1874), Three vols. (Boston: Little Brown & Co., 1905),1:vi.

George Ord finished the eighth and nineth volumes in 1814 and Wilson's work remained authoritative until 1825, when American Ornithology or, The Natural History of Birds Inhabiting the United States Not Given By Wilson appeared.[255] Charles Lucien Bonaparte's expansive work was made possible by the large numbers of new specimens collected on exploratory expeditions, particularly Long's expedition to the Far West, Titian Peale's collecting expedition to Florida, and the return of the Lewis and Clarke expedition.[256] Bonaparte increased the number of known ornithological species and introduced the concept of synonymy into the science of ornithology.[257] He recognized that new species could only be classified accurately if compared to, and correlated with, existing classifications. Latinized binomes were an improvement over folk, or common names, but the Linnaean system failed to regulate the derivation and application of scientific names.[258] Synonymy was requisite to taxonomic consistency, since one species could have several "scientific" names. These names conformed to the Linnaean system, but they were almost as idiosyncratic and colloquial as their "common" counterparts.

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[255] Stresemann, Ornithology, p.154, 156, 298.

[256] Stresemann, Ornithology, pp.155-156 and E. Coues, Key to North American Birds, p.xix.

[257] Coues, Key to North American Birds, p.xx.

[258] Josslyn Van Tyne and Andrew Berger, Fundamentals of Ornithology (New York: Dover Pubs. Inc., 1971) p.350.

By 1831 three seminal zoological treatises had appeared, and one of these works even originated in the United States. The Zoographia Rosso-Asiatica (Pallas) had been released by the St. Petersburg Academy of Science in 1827,[259] Fauna Boreali-Americana (Richardson and Swainson) had been published, and the first installment of Audubon's Ornithological Biography (5 volumes, 1831-38) had appeared.[260] One year later, a Manual of the Ornithology of the United States and Canada, written by the botanist Thomas Nuttall (1786-1859), was published.[261] This book bore the distinction of being the first "handbook" on North American ornithology.[262] Consequently, Nuttall joined Audubon and Bachman,[263] Richardson and Swainson, Wilson, Bonaparte, and Pallas as the acknowledged authorities on North American

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[259] Stresemann, Ornithology, p.69fn.

[260] Coues points out that while Audubon deserves credit for the illustrations in these volumes, credit for the nomenclature and classification of the birds reproduced in this volume belonged to William Macgillivray. Macgillivray was also responsible for the systematic analysis of the anatomical structure of American birds. Key to North American Birds, p.xxii. See also Stresemann, Ornithology, p.314.

[261] Nuttall's other publications included: The Genera of North American Plants and a Catalogue of the Species to the year 1817, (1818) and A Journal of Travels into the Arkansas Territory During the year 1819, (1821) and An Introduction to Systematic and Physiological Botany, as well as a supplement to Michaux's North American Sylva, 3 vols., (1846).

[262] Coues, Key to North American Birds, p.xxi.

[263] Audubon's series on mammals (The Viviparous Quadrupeds of North America) was published between 1842 and 1859. The first three volumes were co-authored with his sons, and the last two volumes were published posthumously due to John Bachman's (1790-1874) assistance.

zoology, and their works were unrivalled until Spencer Fullerton Baird's publications on North American mammals and birds appeared in 1857.[264]

Baird's assessment of the empirical deficiencies was combined with a critical examination of the collecting and preservation processes associated with natural history. Specimens were generally still identified by comparison with previously processed specimens, and this practice often had unfortunate ramifications:

> Hitherto, officers of the army returning to Washington have generally been obliged to send or carry these objects out of the city, for the purpose of identification or verification, thus involving a considerable loss of time and credit. These specimens becoming widely scattered, rarely return hither, and when another occasion arises, the whole labor has to be repeated.[265]

A comprehensive collecting program in which specimens were well preserved and properly identified would supply the data for Catalogues, which could later be taken afield and used for identification, rather than taking the previously prepared specimens. He wanted to prevent the deleterious effects that sending preserved and labelled specimens into

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[264] See: S.F. Baird, Catalogue of North American Mammals, chiefly in the museum of the Smithsonian Institution, (reprinted from vol. 8 of Pacific Railroad Report, coauthored with Charles F. Girard), 1857 and, Catalogue of North American Birds, chiefly in the museum of the Smithsonian Institution, (reprinted from vol. 9 of the Pacific Railroad Report, coauthored with Charles F. Girard), 1859. (The Smithsonian publications examined here appeared a year later than the original Pacific Railroad Reports.

[265] SIAR, 1850, p.45.

the field had had on his natural history collections.

Baird's penchant for catalogues was neither unique nor unprecedented. James E. Gray, curator of the British Museum, had his first catalogue printed in 1844.[266] Catalogues describing the birds, reptiles, fishes, shells, sponges, crustaceans and insects found in the Museum, as well as a general bibliographic catalogue, soon joined the Systematic Catalogue of Mammals. But the British catalogues tended to be primarily demonstrative.[267] So far as Gray was able to obtain funding for his catalogues, they testified to the expropriatory powers of his Museum: "To Gray the term catalogue meant more than a volume made for a reader containing references to books. It referred equally to a descriptive inventory of an order of the animal kingdom."[268] Baird's catalogues, like those compiled at the British Museum, were enumerative and descriptive. But the primary purpose of the American catalogues was more immediately useful and pragmatic.

Baird endeavoured to foster collecting on a grand scale, but he also attempted to regulate the processes of collection and preservation as rigorously as possible. Moreover, without Baird's Catalogues, the identification and

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[266] Albert E. Gunther, A Century of Zoology at the British Museum: Through the Lives of Two Keepers, 1815-1914 (Kent, England: William Dawson & Sons Ltd., Cannon House, 1975), p.115.

[267] Ibid., pp.178-181.

[268] Ibid., p.24.

collection of northern specimens would have been hampered severely. Kennicott recommended that northern collectors record their observations according to the format found in Baird's Catalogues, and these Catalogues were especially important to collecting activities in the Mackenzie River District. It was, if not impossible, very impractical to send previously processed specimens for comparative purposes.[269]

Baird's monographs on birds and mammals facilitated field identifications and provided a blueprint for the compilation of data. But the collections accumulated at the Smithsonian also allowed Baird to describe many new species. His Catalogues included many species unavailable to even Audubon or Bachman when they wrote their zoological treatises in the previous decade. Baird's publications contained two hundred and ten new avian species, and seventy new mammalian species.[270] The inclusion of these newly discovered species was made possible through the receipt of collections that exceeded any previously obtained from the Topographical Corps,[271] and such an expanded data base necessitated an extension and reorganization of the classificatory system

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[269] Letter from Kennicott to MacFarlane, 29 April 1863, SIA, RU 7072.

[270] William H. Dall, "Professor Baird in Science," SIAR, 1888, p.732. Verification of Dall's calculations is found in the Appendices of Baird's Catalogue of North American Mammals, p.xv, and Catalogue of North American Birds, p.lvi.

[271] Daniels, Science in American Society: A Social History, p.182.

that was used only two decades earlier.

Baird's Catalogues not only expanded but clarified existing schema to facilitate the identification of the many specimens arriving at the Smithsonian.[272] He added one new genus and seven new sub-genera to the mammalian classificatory schema, and he added nineteen genera and two sub-genera to Audubon's avian classification.[273] Baird used a combination of morphological and anatomical criteria, as suggested by Cabanis and Sundevall, to classify North American birds and, in 1866, he suggested that Passeres (Passeriforms or perching birds) was the highest order of birds.[274] Baird's contention that the order Passeres should be placed ahead of the order Raptores (carnivorous birds

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272 Taxonomic revision is undertaken to either clarify ordinal relationships, or to expedite species identification. The first type of revision entails a complete reorganization of a classificatory system and expresses fundamental assumptions about the evolutionary relationships within, and between classes. The second type of revision tends towards a multiplication of the numbers of families, genera, species and sub-species, in order to provide a comprehensive framework for identification purposes. Baird's revisions obviously exemplify the latter case. For a discussion of the nature of taxonomic revisionism see Herbert Friedmann, "Recent Revisions in Classification and their Biological Significance," in Recent Studies in Avian Biology, ed., Albert Wolfson (University of Illinois Press, 1955), pp.23-24.

273 Information on Baird's contribution to mammalian classification can be found in the Catalogue of North American Mammals, pp.xviii-xxxiv. More specifically, Baird introduced the following genera in his Catalogue of North American Birds: Bucephala, p.xxiii Pedioecetes, p.xxi and liv Sphyrapicus, p.xviii, xxviii, 80, 101 Oreortyx, p.xlv Heleroscelus, p.xxii, xlvii, 728, 734 Micropalama, p.xxii, xlvii, 714, 726 Stelgidopteryx, p.xxxiv, 312 Catherpes, p.xix, xxvi,

currently contained within two ordinal divisions, the Falconiformes and the Strigiforms) is indicative of a reaffirmation of a hierarchical classificatory system, but a hierarchy contained within the branching conception of development.[275] Baird's hierarchy was characterized by a strong ambivalence to its consequences and an official denunciation of the utility of ordinal divisions for nonpalaeontological classification.[276] Baird, Brewer and Ridgway advocated the adoption of classical systematics, and the division of the History of North American Birds into series based on land and water birds ostensibly conformed to their theoretical positions.[277] Their monographs on land and water birds were, however, subsequently divided into major groups, roughly equivalent to ordinal divisions, thereby

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354, 356 Oreoscoptes, p.xix, xxxv, 346 Phainopepla, p.xix, xxxiv, 923 Protonotaria, pxix, xxxi, 235, 239 Oporornis, p..xix, xxxii, 240, 246 Melospiza, p.xx, xl, 440, 476 Rhynchophanes, p.xx, xxxviii, 432. Baird also added the following sub-genera in his Catalogue of North American Birds: Xenopicus, p.xviii, xxviii, 83, 96; Lanivireo, p.xix, xxxv, 329 Helospiza, p.xx, xl, 476. His subsequent publications also contained new species and new classificatory divisions.

[274] Robert Ridgway, "Spencer Fullerton Baird," SIAR, 1888, p.707. The ornithologists to whom Ridgway referred are Jean Cabanis (1816- 1906) and Carl J. Sundevall (1801-1875). Cabanis wrote Ornithologische Notizen (1847) and Sundevall wrote Ornithologiskt System, (1835 and 1843). See Stresemann on these European ornithologists, Ornithology, pp.236-38.

[275] In the eighteenth century morphological characteristics provided sufficient proof of the "great chain of being," but Cuvier's classification based on anatomical evidence replaced a hierarchical arrangement with four equal but different categories of animal life (see Chapter 2). The branching conception of organic development had largely been accepted by the 1860s and, particularly after Darwin, taxonomic hierarchy is viewed as indicative of

inadvertently testifying to the strength of evolutionary theory.

Baird's revision of avian classification was therefore highly synthetic, as was his rationalization of ornithological nomenclature. Baird's Catalogues represent the final phase of the early development of an international system of nomenclature. Baird's notes distinguished between vernacular and scientific terminology, as well as between an idiosyncratic and systematic approach to nomenclature. Geographical, morphological and even honourific designations were maintained, although he agreed with Swainson that criteria derived from mythology, history or the Bible were unsuitable basis for scientific names. His approach also differed from Swainson in that his rationalizations of ornithological nomenclature adhered strictly to the principle of priority.[278] In his 1857 Catalogue, for example, Baird adopted the name Zonotrichia albicollis which had first been applied to the white-throated sparrow by

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debates on evolutionary development. Baird's sympathies lay with Lamarckian rather than with Darwinian theory and his discomfort with ordinal divisions is possibly indicative of a fear that partial agreement with Darwinian assumptions would be tantamount to an admission of the veracity of Darwinian theory in its entirty.

[276] Baird, Brewer and Ridgway, History of North American Birds, p.xiii.

[277] Aristotelian functionalism divided birds into these two main groups, which were subsequently divided into subgroups based mainly on diet. Stresemann, Ornithology, pp.41-42.

[278] See Stresemann on Swainson, p.264.

Bonaparte in 1850. This name was subsequently adopted by the American Ornithologist's Union and retained in their Checklist,[279] although it was previously named Fringilla albicollis by Gmelin and Wilson, Passer pennsylvanicus by Brisson, Fringilla pennsylvanica by Latham and Audubon, Fringilla (Zonotrichia) pennsylvanica by Swainson, and Zonotrichia pennsylvanica by Bonaparte in 1838.[280]

By the late 1850s Baird was entering one of his most productive periods at the Smithsonian. He had largely abandoned field studies, concentrating his energies on the administration of the natural history department, and on the tasks associated with collating the massive amounts of data and specimens arriving at the Smithsonian.[281] Moreover, by 1860, he had moved the avian sciences to the forefront of the research and collections programs in the natural history department. Baird had become particularly interested in the effects of the environment and climate on species differentiation and variation and, in one of his first letters to Chief Trader Bernard Rogan Ross, he stated his special interest in northern birds:

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[279] A.O.U. Checklist, p.621.

[280] S.F. Baird, John Cassin and George Lawrence, The Birds of North America: The Descriptions of Species Based Chiefly on the Collections in the Museum of the Smithsonian Institution, Natural Sciences in America, Keir B. Sterling, ed. (Philadelphia: J.B. Lippencott & Co., 1860; reprint ed, New York: Arno Press, 1974), p.463.

[281] Robert Ridgway, "Spencer Fullerton Baird," SIAR, 1888, pp.709-10.

> Of the birds themselves [in addition to their eggs] we would also be glad to have a full series; for comparison with more southern ones. I have I think established the principle that to a certain extent the more northern the locality of a bird the larger it is, and I wish to test this in reference to more Arctic specimens.[282]

Baird increasingly applied his talents to studies of species variation and the phenomena of cline throughout the 1860s, and his research was contemporaneous with researches undertaken by two European ornithologists, Carl Bergmann and Constantin Lambert Gloger. Baird found, as had Bergmann and Gloger, that body size increased with decreasing temperatures, and that plumage tends to darken in humid climates.[283]

Baird's theories on the correlation between regionalism and morphological distinctiveness differed significantly from those advanced previously because he substituted first hand observation for a reliance on often erroneous documentary sources. He based his conclusions on the empirical evidence made available through the Smithsonian Programs. The Institution had received zoological specimens from throughout North America, and climatological data was

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[282] Letter from Baird to Ross, 26 March 1859, SIA, B.R. Ross Notebook, RU 7221.

[283] Two of the attributes that Baird found linked to climatic factors were accorded constancy in honour of Bergmann and Gloger. Stresemann, pp.321-22 and p.243. Bergmann's Rule predicts that body size will be larger in cooler climates than it will be in warmer climates and Gloger's Rule equates colour intensity with humidity levels. It predicts that plumage will be darker in humid climates than it will be in arid climates. Olin Sewall Pettingill, Jr., Ornithology in Laboratory and Field, 5th ed. (New York: Academic Press Inc., 1983), p.111.

available through Henry's meteorological program. The Smithsonian had been accumulating information on the temperature and humidity of the continent since 1849, and access to meteorological statistics enabled Baird to account more convincingly for deviant morphology.[284] Baird documented the effect of climate on bill size and colouration in 1866,[285] and the conclusions from his research on avian variability influenced the direction of studies on geographic speciation later undertaken by Coues, Ridgway and Allen.[286]

Baird's studies in speciation and adaptive change were characterized by the growing tendency towards positivism associated with the biological sciences. Never before had

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[284] Elias Loomis submitted a proposal advocating the establishment of a large scale meteorological program at the Smithsonian in 1848, and in 1849, the Smithsonian distributed Circulars to correspondents in the United States. See, "Appendix 2, 'Report on the Meteorology of the United States: by Professor Loomis, Submitted to the Secretary of the Smithsonian Institution,'" <u>SIAR</u>, 1848, pp.193-94 and <u>SIAR</u>, 1850, pp.12-13.

[285] See: S.F. Baird, "Notes on a collection of Birds made by Mr. John Xantus, at Cape St. Lucas, Lower California," <u>Proceeding of the Academy of Natural Sciences of Philadelphia</u>, 1859 (1860):300, and S.F. Baird, "The Distribution and Migrations of North American Birds," <u>American Journal of Science and Arts</u>, 2nd ed., 41 (1860):190-91. cited in Stresemann, <u>Ornithology</u>, pp.243-44.

[286] Alden H. Miller, "Concepts and Problems of Avian Systematics in Relation to Evolutionary Processes," in <u>Recent Studies in Avian Biology</u>, ed., Albert Wolfson (University of Illinois Press, 1955), pp.6-7. Ridgway tended to favour assigning species status to variations rather than assessing variants of species as subspecies. Stresemann, <u>Ornithology</u>, p.244, and Joel Asaph Allen (1838-1921) consciously sought the mechanism responsible

naturalists been so insistent that publications and research rest on hard data. Baird and his contemporaries revered field work, and scorned the second or third hand data used by the "closet" naturalist.[287] Baird, however, did not shun the scholarly side of avian studies, but based his taxonomic revisions on the evidence derived from the Smithsonian collections. His monographs included only those species that he had personally examined. He refused to incorporate species within his publications that had only been described elsewhere. He insisted that verifiable data was the only acceptable source of information. His entries were generally based on the examination of several specimens, and he consequently introduced an elementary statistical analysis to zoological studies.[288]

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for producing the correlation between environmental and taxonomic characters, and he predicted that bills, tails and other body extensions are apt to be longer in warm climates than in cooler climates, (Allen's Rule) thus codifying a hypothesis suggested by Baird as early as 1866. Stresemann, Ornithology, pp.244-245 and Pettingill, Ornithology in Laboratory and Field, 5th edition (New York: Academic Press, 1985), p.111.

[287] Ridgway, "Spencer Fullerton Baird," SIAR, 1888, p.706.

[288] The body measurements and colouration of the Icelandic falcon were, for example, based on 25 specimens of *Falco gyrfalco islandicus* and six specimens of *Falco gyrfalco sacer* (MacFarlane's falcon) were similarly used. Specifications regarding the golden eagle were based on an examination of sixteen specimens of *Aquila chrysaetus canadensis* and so on. See The History of North American Birds, vol. 3, pp.113-115, 115-116 and 314-320. See Alden Miller for a discussion of Baird's statistical techniques, "Concepts and Problems," p.7.

Baird's rejection of a purely "bookish" approach to avian classification and identification necessarily intensified his desire to build a comprehensive natural history collection, particularly with regard to the more northerly portions of the continent. Many types of natural history specimens were needed for the Smithsonian collections and twenty copies of Baird's first Circular were sent north to ensure that their specimen needs were met.[289] Zoological specimens, including embryonic and osteological specimens; botanical and geological specimens, including palaeontological specimens; as well as soils and sediments containing microscopic plants and animals were desired.

Baird was, however, especially interested in the ornithological sciences and in 1860 the Smithsonian published and distributed a pamphlet entitled "Instructions

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[289] See "Invoice of books sent out by the Smithsonian Institution to St. Paul, March 1861, for B.R. Ross." SIA, RU 7002, Box 66. Sixteen copies of the Circular on the preservation of nests and eggs (139) were also sent to Baird's Rupert's Land correspondents in March 1861. SIA, RU 7002, Box 66. These instructions were also available in the Smithsonian <u>Annual Report</u>, and the HBC collectors had also received this publication from Baird. See: S.F. Baird, "Directions for preserving, collecting and transporting specimens of natural history," 1856: 235-253 and "Instructions in reference to collecting nests and eggs of North American birds," 1858: 153-157. Other instructions were also found in the <u>Annual Reports</u>. See especially "Instructions for Collecting Insects," 1858: 158-200, including John LeConte on "Instructions for Collecting Coleoptera," H. Loew and R. Ostensacken on "Instructions for Collecting Diptera," and Brackinridge Clemens on "Instructions for Collecting Lepidoptera." The Smithsonian's anthropological "Instructions" were also sent north. See, letter from MacFarlane to Baird, 6 May 1863, SIA, RU 7215, Box 14.

in Reference to Collecting Nests and Eggs of North American Birds."[290] This pamphlet had been written by Thomas Mayo Brewer, one of Baird's closest friends and colleagues, to encourage collectors to submit data and specimens necessary to his study of "North American Oology." Brewer was interested in all facets of oviparous studies since:

> Only in Europe have any illustrated works upon the local Oology been published, and those are chiefly confined to its more northern portions. We have no knowledge of the eggs of more than one tenth of the species of birds ascertained to exist. ...Yet it is not difficult to see that Oology promises to be an important auxiliary both in aiding[?] to determine natural divisions, and to enable us to decide in regard to varieties the specific identity of which is in doubt.[291]

Brewer, like Baird, refused to include drawings from illustrations of specimens that were unavailable for inspection.[292] And he needed northern specimens to complete his study of the geographical distribution of North American birds during the breeding season.

The Smithsonian received many new ornithological and oological specimens following the release of Brewer's "Instructions," but the increasing size and diversity of their collections merely convinced Baird and Brewer of the gaps yet existing in their collections. Brewer's

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290 Smithsonian Miscellaneous Collections, 139, 2nd Edition, Vol.2, 1862.

291 Thomas Mayo Brewer, North American Oology, Part 1, Raptores and Fissirotres, Smithsonian Contributions to Knowledge, 89 (Washington: Smithsonian Institution Press, 1857), p.v.

292 Ibid., p.iv.

"Instructions" were therefore reissued in January 1861 with two attachments. A Circular from Baird indicating the "desiderata" or species needed to complete Brewer's oological work and an article by the English Oologist, Alfred Newton, on the preparation of eggs were appended. The "scientific" nature of Brewer's project appealed to Henry and he supported it, albeit with qualification:

> The object contemplated by the Institution is thus not merely to procure specimens of eggs not previously in its museum but also to obtain positive evidence as to the limits within which each species rears its young.[293]

Brewer's "Instructions" provided unsurpassed detail regarding the preservation processes in the oological sciences, and they also identified specifically the species needed in the preparation of the forthcoming History of North American Birds. Vultures, hawks, owls, woodpeckers, warblers, jays, ducks, geese, sandpipers and auks were of particular interest, although Baird noted that the Smithsonian had many deficiencies in its oological collections. It needed specimens from seven regions within North America, four of which were potentially accessible through the Mackenzie River District.[294] Specimens from the

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[293] Ibid., p.1.

[294] The Mackenzie River district was located within reach of four of the seven regions listed in the Smithsonian Circular: "Instructions in Reference to Collecting Nests and Eggs of North American Birds," Smithsonian Miscellaneous Collections, 139, namely: "Birds Breeding in British America, East of the Rocky Mountains;" "Birds from the Northern and Northeastern Sea-Coast of North America;" "Species of the Rocky Mountains and Adjacent Plains," and; "Birds of the Pacific Coast Region of

breeding grounds along the Pacific Coast were especially important to future oological studies:

> It is in this region, especially among the water birds breeding in the more northern portion towards Russian America and Behring's Straits, that the greatest number of deficiencies in the Smithsonian oological collection is to be found. From the mouth of the Columbia northward, every kind of egg, whether of land or water bird, will be an acceptable addition to the series.[295]

Brewer's "Instructions" and Baird's Circular were issued in advance of the 1861 collecting season with the purpose of directing collectors' activities towards filling in the gaps which still existed in their data. May and June were the best months for oological collecting and Brewer requested that collectors obtain as many nests and eggs as possible during this brief period.[296] Nests required little

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North America." Access to these breeding grounds was, via the Mackenzie River District, much more limited than either Baird or Kennicott understood, but it was undoubtedly the lure of these untapped specimen reserves that accounted for Kennicott's obsession with getting to the Yukon and beyond into Russian America. By December 1860, however, Kennicott had abandoned the idea of going on to the Russian posts. He felt that he could make better collections at less expense while at the HBC posts. Moreover, he discovered that it was unfeasible to travel by land to the Russian coast: "I've given up all idea of trying the Russian posts, as the prospects are better elsewhere and I'm quite in the dark as to means of carrying on operations there - maybe within the next ten years we'll find ways & means to send me or some one else around by water!" Letter from Kennicott to Baird, 18 December 1860, SIA, RU 7215, Box 13.

[295] "Instructions in Reference to Collecting Nests and Eggs of North American Birds," Smithsonian Miscellaneous Collections, 139, p.10.

[296] Nests as well as adult specimens were used for identification of eggs, although nesting characteristics were also important components of bird biographies.

preservation beyond being carefully packed for transport, but the more delicate eggs had to be emptied, cleaned and labelled.

Oological preservation began with the excision of a small, circular piece of shell to allow removal of the yolk, albumin and embryo. An egg drill produced the neatest holes, although openings could be cut with scissors, knives or scalpels. Openings, regardless of how they had been made, were to be always cut from one side of the egg. Holes were not to be cut from the ends because these holes made it impossible to accurately measure specimens, and they marred the show surface of a specimen almost as much as holes cut on opposing sides. Brewer and Newton recommended that the removal and cleansing processes be performed through one hole, although if an inexperienced collectors was convinced of the necessity of two holes, the blow hole was to be cut smaller than the hole through which the contents were to be extracted. Moreover, identifying marks were to be printed on the damaged side, whether an egg had a single hole or a pair of holes.

Single hole extractions were facilitated by inserting the fine end of a blow pipe into the egg and gently blowing. This method forced the contents out of the shell by displacement, although suction could be used in the absence of a blow pipe. Special suction tubes with reservoirs were available, but generally contents were removed by drawing small amounts of amniotic fluid into the collector's mouth. Syringes could also be used to suction fluid out of eggs, although syringes were more commonly utilized in the water insertion method. Using this method, the contents of the egg were pushed out of the hole in the side of the egg as the water, which was injected by the syringe, displaced amniotic fluid. Water could also be injected by mouth into the egg, but this was a very tricky procedure. Too much water or excessive pressure would crush the egg rather than empty it. The water insertion method was, despite the hazards, preferred to the suction and blow-out methods. Oologists recommended combining the removal and cleaning processes, rather than following the two-step procedures associated with the suction and blow-out methods.

All cracked eggs were to be salvaged if possible. Tissue and paste could restore some of those eggs which had been broken despite all precautions. It was difficult to advise a collector on the best method to follow so as to avoid destroying good specimens by excessive squeezing, but Brewer pointed out that some breakage could be avoided if the collector held his eggs over a basin of water while emptying them. The occasional dropped egg would then become a less serious matter than if dropped on a hard surface. Brewer also recommended the use of individual layers of cotton packing to reduce breakage in transit. Carefully wrapped specimens were to be placed in small wooden or cardboard boxes, which were to be then packed inside larger wooden boxes. Eggs accompanied by nests were to be wrapped in cotton and packed inside the nest before being put into the wooden packing boxes.

Two special problems often arose in the preparation of fertilized eggs. Hardened yolks were common, and well formed embryos were found routinely. Hardened yolks could be softened and removed after being soaked for a few hours in a solution of carbonate of soda and water. Forceps, scissors or tongs might still be required to remove the softened yolk, but yolk removal required only minimal instrumentation as compared to the removal of embryos.

There were two opinions on the treatment of embryos. Newton valued oological specimens more than embryonic specimens and therefore suggested the removal of embryos, rather than risk breaking an especially valuable egg. Scissors, hooks, scalpels, knives and forceps were needed to disengage and dissect embryos. Brewer, however, was interested in the classificatory relationship between embryonic and adult specimens, and so recommended in situ preservation of embryos:

> Whenever the abundance of the eggs will authorize it, a large number with the young in different degrees of development, even as many as fifty of a kind, should be secured. The embryos in this case need not be removed from the egg, which should, however, be cracked at the blunt end to facilitate the entrance of the spirit. Researches at present in progress relating to the embryology of birds promise results of the highest importance in

reference to ornithological classification.[297]

Brewer's general instructions emphasized the importance of adhering strictly to accepted procedure in the emptying and preparation of eggs, and Newton's appended article reiterated Brewer's comments on the preparatory process. But Newton's appended article went beyond the general admonishments given by Baird and Brewer. It contained a lengthy discussion on his philosophy of the "principal object[s]" or duties of the egg collector to science. Newton used the word "object" but he clearly meant "obligation," and his discussion on identification and "authentication" as primary obligations formalized assumptions held by practising oologists.

Oological specimens were virtually useless without reference to at least one parent for identification purposes or, in the absence of an adult specimen, copious notes. Descriptions of habitat, locale and nest structure, and the general bird population were to be recorded to enable even tentative identification. Observational evidence would have to substantiate oological identifications in the absence of ornithological corroboration. An assessment of the reliability of the field collectors' identifications therefore depended on a reference point. This reference point was provided by the process of authentication, which

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[297] Thomas Mayo Brewer, <u>North American Oology</u>, Part 1, <u>Raptores and Fissirostres</u>, Smithsonian <u>Contributions to Knowledge</u>, 89 (Washington: Smithsonian Press, 1857), p.6.

provided the only indication of the collector's identity. Oological collectors, regardless of their educational background, expertise or experience, were to therefore identify themselves clearly.

The HBC collectors were often reminded of the crucially important role that their collections played in the extension of the zoological sciences. Large collections were appreciated for their distributive and augmentative functions, but the northern collections were particularly important because they verified the data contained in contemporary treatises on northern natural history, and because they completed the material basis necessary for research on the distribution of North American plants and animals. All specimens were acceptable acquisitions, but the many birds sent south were particularly important to Baird's research. Common and rare, as well as resident and migratory, birds were sent south.[298] Swallows, terns, gulls, geese, falcons, owls and warblers were but a few of the species sent to the Smithsonian.[299] Duplicates depicting the

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[298] Information on the zoological and anthropological specimens submitted to the Smithsonian has been obtained from: "Index to Catalogue of Specimens," and "Packing Account and Recapitulation of Seven Cases of natural history specimens, 01 June 1862- 20 September 1862", in SIA, RU 7215, Box 29, Folder: B.R. Ross; "List of specimens collected at Great Slave Lake, 1868," SIA, RU 7215, Box 13, Strachan Jones; "List of specimens of natural history, 1865" SIA, RU 7215, Box 9, C.P. Gaudet; and Registers, Accession Records, Anthropology Department, Smithsonian Institution, vols.,1,2,3, SIA, RU 699T and Computer Printout, Ident: MNH4 122G113, MNH-ANN

[299] See Appendix 3 for examples of invoices detailing the

seasonal variations exhibited by particular species were often sent south, and most ornithological specimens were accompanied by both nests and eggs.

The HBC collectors also sent fishes, reptiles, amphibians, insects and shells, but in significantly fewer numbers than birds and eggs specimens. Geological specimens, including minerals, rocks and fossils, made up a small percentage of the packets sent south, as did botanical specimens. Many mammals, particularly the fur-bearing animals which had in fact lured the HBC to the region, were sent to the Smithsonian. The skins and skeletons of the marten, mink, beaver, fox and wolf were accompanied by specimens of mice, shrews, moose, caribou, buffalo, mountain goats and Indian dogs. Collections of mammal skulls were often sent independently, and the embryos of mammals, birds and other animals were sent when available.

Baird always expected field collectors to develop at least minimal proficiency in preservation techniques, and his "Directions for Collecting, Preserving and Transporting Specimens of Natural History" reflected those expectations. Ornithologists, for example, depended upon well preserved specimens, accompanied by accurate and appropriate field notes to produce descriptions of North American birds. The authenticity of the illustrations and chromolithographic

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specimens sent south.

plates contained in ornithological monographs was also dependent upon the receipt of high quality specimens.[300] Baird's Circular facilitated such collections by introducing the principles, policies and procedures acceptable for the scientific purposes of the natural history department and his Circular was composed so as to "... enable any one, with but little practice, to produce specimens sufficiently well for the ordinary purposes of science."[301]

Baird's interest in geographical distribution, combined with an awareness of the propensity of collectors to favour unusual or rare varieties over the common species, made him sensitive to the necessity of representative sampling. He therefore suggested that the first collections in any region consist of the common species, and that collections of rare species should always follow the common, unless transportation limitations dictated otherwise. He also advised routine preservation of all species previously uncollected. This procedure was intended to ensure that, even if of inferior quality, a species was procured. Nor should any information be omitted or an unusual source of

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[300] See, for example, the plates in Baird, Brewer and Ridgway, History of North American Birds, 3 vols., 1874.

[301] Although the "Directions for Collecting, Preserving and Transporting Specimens of Natural History, Prepared for the Use of the Smithsonian Institution," reflected the Smithsonian's early reliance on U.S. military expeditions as a source of natural history specimens, they were well suited to the conditions under which northern specimens were collected. Smithsonian Miscellaneous Collections, 34, Third Edition (Washington: Smithsonian Institution, 1859), p.3.

specimens be overlooked. The contents of the gastro-intestinal tracts of dead animals and the parasites found on host carcasses were as useful to science as the primary specimen. However, Baird pointed out that the value of these specimens, like all others, declined if they were submitted minus data on their locality, date of capture, habits and "peculiarities," sex, colour of the iris and body measurements. Recorded notes were, in fact, useful on their own account and Baird pleaded with collectors to diligently record their observations in the field and to compile lists of species sighted but not collected. Baird also pointed out that the physical act of collecting specimens could be facilitated through consultation with indigenous inhabitants, especially with hunters and other persons reputed as having extensive knowledge of local animal resources. Moreover, the comments of both indigenous and immigrant residents should always be incorporated within field notes.

Baird valued common sense in specimen collection, and he addressed an immediately practical matter within the section entitled "General Remarks." Organic materials such as wool, hair and feathers were not to be used as stuffing or packing materials. These animal products were often contaminated with the insect eggs that produced the larval infestations which were a chronic problem in specimen preservation. Larval damage rendered specimens useless as research and display skins, and the many hours invested in collection, preservation and packing would be wasted if natural nesting materials were used by field workers.

Baird also provided a checklist of apparatus and materials necessary to fieldwork. Unfortunately, the HBC collectors were often forced into making do with home grown substitutes for the some three dozen items recommended in the Smithsonian Circular, although Baird did his best to supply them with the recommended equipment and supplies: two wooden chests or two leather panniers, two copper kettles, six tin preserving cans, an iron wrench, two inflatable India-rubber bags, small lino, cotton or mosquito-netting bags, pencils, parchment, fishing line and hooks, small seines, pocket scoop-net and casting net, alcohol, arsenic, alum, salt petre, tartar emetic, strychnine, camphor, cotton stuffing, botanical paper, cotton twine, butcher knife, scissors, needles and thread, common pins, blank labels, portfolio for carrying plants, press, botanical blotting paper, small bottles, geological hammer, double-barrelled gun, rifle, fine shot, pocket case of dissecting instruments, mineralogical blowpipe, pocket vial for insects, ether, insect pins, cork-lined boxes and a pocket notebook with metallic paper.[302]

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[302] Soon after Kennicott arrived in Fort Simpson he ordered all of these items. Letter from Kennicott to Baird, 18 June 1859, SIA, RU 7215, Box 13.

Baird's Circular also contained lists of the natural history specimens wanted at the Smithsonian. Mammals, birds, reptiles, fishes, amphibians, embryos, skeletons, invertebrates, microscopic organisms, nests, eggs, plants, minerals and fossils were all wanted by the Natural History Department. Baird described proper recording procedures and the recognized, as well as practicable preservation techniques, for each in turn.[303] Graphic depictions of the techniques used in the processes of preservation, particularly skinning and stuffing, along with straightforward and practical instructions on the handling of zoological specimens, more than compensated for the explanatory deficiencies exhibited in the very cursory discussions on hunting, trapping and netting. Intuition and ingenuity were apparently the only assets required for specimen procurement, and collecting skills were largely self-taught. Nothing, according to the English oologist Alfred Newton, was more instructive to the novice than actual collecting experience, although once obtained specimens had to be processed according to recognized scientific standards.[304]

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[303] This is how this Circular differs from that sent by Henry to the Officers of the HBC. Descriptions of the kind of data and specimens wanted by the Smithsonian, were given in Henry's first Circular, but no details of the preservation processes were included.

[304] Alfred Newton, "Suggestions for forming Collections of Bird's Eggs," appended to Smithsonian "Circular in Reference to Collecting Nests and Eggs of North American Birds," Smithsonian Miscellaneous Collections, 139, Vol.2, 1862, p.12.

The routine preservation of ornithological specimens was similar enough to the preservation of mammalian specimens to render repetition unnecessary in Baird's "Directions." Similar skinning techniques and preservation procedures were, with two exceptions, followed for both birds and mammals. Small specimens of either class were treated with arsenic compounds, although a concoction of alum and salt petre was substituted for arsenic when treating the much greater surface area involved in the preparation of mammal skins. Moreover, while both mammal and bird specimens were susceptible to larval damage, the larger skins required more radical treatment than the smaller specimens, not only because of their size, but also because the hair, wool and fur covering them was highly susceptible to gnats. Once specimens had been infiltrated by larvae, eradication of the pests was impossible. Irreparable damage could only be averted if insects were kept away from the stuffed specimens. Healthy doses of kreosote, ether, chloroform, turpentine and tobacco leaves were therefore applied to prepared mammal skins.

The preservation of birds began virtually as soon as a specimen was killed and Baird described the procedures fully. Shot holes, the mouth and nostrils were to be immediately plugged with cotton to prevent the escape of blood and gastric juices, and the bird was then to be thrust, head first, into a paper cone. Specimens were to be stored in these cones until they could be measured, skinned and packed. The length, wing span and girth of the birds were to be measured just prior to skinning, since the girth measurement was taken for accuracy in stuffing mountable specimens. The proper size of the bird had to be ascertained before skinning because these skins tended to stretch.

Once measured, an incision was to be made from the lower end of the breast bone to the anus, removing protruded organs immediately. Muscle and fat were to be scraped away as the skin was peeled back off the body, and plaster of paris was to be applied to absorb blood and grease. Next, the wings were to be separated from the skeletal frame, the brains and eyes removed from the skull, and the sex of the specimen determined through examination of the body cavity in the small of the back. The specimen, thus cleaned and disjointed, was then ready for preservation with arsenic powder, or arsenical soap. Once the preservative had been applied, the skin was to be pulled back into its normal position and the wings tied into place with a string attached, subcutaneously, to the lower forearms. Finally, the legs were to be skinned to the wrist, the muscle removed and arsenic applied over an intact pair of tarsii. The necks and bodies were to then be stuffed with cotton (as little as possible, and certainly less than life size), the incision stitched and the wings, feathers and legs arranged before placing the specimen in another paper cone for storage.

Baird continually emphasized the importance of accurate labelling throughout this process. He never failed to point out that the utility of an improperly labelled or, worse, an unlabelled specimen was reduced substantially from those that had been duly processed. Baird wanted at least one specimen from every ornithological species collected and preserved in conformity with the specifications in his Circular, but he gratefully accepted additional specimens. He was particularly anxious to receive multiple sets of bleached and disjointed skeletal parts for the Smithsonian's osteological collection. Series of bones, especially skulls, provided the anatomical evidence that was used along with morphological criteria in zoological classification. Baird therefore included directions for the preparation of osteological specimens in his Circular.

Dryness was the critical factor in the preservation of bones and therefore the removal of fluid and fatty cells were the most important processes involved. Blood and viscera were commonly removed from osteological specimens by soaking and boiling. A little lye was sometimes added to the boiling water to hasten the cleaning process although tissue removal could still take a week or longer for large birds and other bigger animals. Some adipose tissues were not removed by either soaking or boiling, and these fatty substances could only be eliminated by immersing the specimens in ether. The greaseless bones were to then be air-dried.

Baird also gave specific instructions for the preservation of fishes, embryos and marine invertebrates. These specimens were preferably, and usually unavoidably, preserved in alcohol or one of the substitutes prescribed for wet preservation. Alcohol, even diluted potable spirits, was the preferred solution for liquid preservation, although when unavailable, other preservatives were often substituted.[305] Salt brines were the most common substitutes for alcoholic preservatives, although even dry salt was used occasionally. Dilutions of Goadby's Solution A, or "aluminous fluid" and Goadby's Solution B, or "saline solution," were also used in place of alcohol. These solutions were composed of rock salt, alum, corrosive sublimate and boiling water. Differing concentrations of corrosive sublimate or rock salt produced either 'A' or 'B'.

The necessity for wet preservation made fishes and other marine specimens the most difficult specimens to process and ship out of the north. Plants, minerals and fossils were, on the other hand, the easiest specimens to collect and process, if not always the easiest to transport. Satisfactory botanical collections could be made simply by pressing specimens between folios, and ensuring that each was accompanied by adequate notation. Similarly, minerals and fossils required little exertion, or expertise, beyond

[305] In the Mackenzie River District only "medicinal alcohol" was legal for consumption. See Minutes of Council, Northern Department, 1848, Resolution 88, B.239/k/12; 1862, Resolution 80, 1864, Resolution 74, H.B.C.A., PAM, B.239/k/13.

that associated with labelling and packing. Crumbling fossils required some attention, but few collectors would resort to the efforts required to mend a fossil by soaking it in glue or melted wax, when fossils were easily obtained.

Transportation rather than preservation was the major deterrent to the collection of northern fossils and minerals. Comparatively smaller numbers of geological specimens were submitted by the HBC collectors not because the specimens were difficult to obtain or to preserve, but because of the difficulties associated with shipping them south. Many very valuable zoological specimens could be shipped in place of a few rather large and bulky fossilized skeletal parts, or in place of the smaller but equally heavy geological specimens. Practicality was a primary consideration when collecting in the field, and nowhere were Baird's cautionary remarks more applicable than in the Mackenzie River District. The specimens, which were finally received in Washington, had withstood the jostles and bumps of cart, canoe and dogsled for half of the more than four thousand miles separating the American capital and Fort Simpson. The scientific value of a specimen had to be weighed against the effort required in its acquisition.

Most natural history and anthropological specimens could be collected throughout the year. However the oological specimens, which Baird wanted above all others, were only available from the middle of May to the beginning of July.

It was virtually impossible for collectors to complete the processes of identification, cataloguing, preservation and packing, before the summer packet departed Fort Simpson in mid-June. In effect, there were only two opportunities to send out large quantities of specimens from Fort Yukon. They could be sent in the boat leaving on 1 June, or in the winter express which left in either October or November.

A boat was dispatched from Fort Yukon and stopped at La Pierre's House by 1 June. It arrived at Fort Simpson in mid-June just before the winter packet, which had left Fort Garry the previous December, had arrived. On 1 July, the officer-in-charge of Fort Yukon travelled by canoe to Fort Simpson in order to pick up post supplies arriving on the Methy Portage Brigade.

The winter express, which left Fort Yukon after the ice had set, was the one alternative to water travel. It arrived in Fort Simpson just before the winter packet left for the south in December. The five thousand mile journey between Fort Yukon and Washington could be shortened from thirteen to ten months by sending freight on the winter express, but since the peak period for oological collecting was in the Spring, the specimens would still have been collected fully thirteen months before they were received at the Smithsonian.[306]

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[306] See letter from Kennicott to Baird, 27 July 1859, for an extensive discussion of northern transportation and communication routes. SIA, RU 7215, Box 13, and see letters from James R. Clare to Baird, 1866, for

It generally took six months to ship freight from Fort Simpson to Fort Garry, regardless of the time of year or mode of transportation used, providing the goods went straight through and were not detained en route at Fort Simpson or Norway House. Once received at Fort Garry the specimens were shipped by either steamboat or cart to St. Paul, and from St. Paul they would travel by rail to the American capital. The trip by rail was also hazardous to the safety and security of the specimens since derailments were often reported.[307]

Kennicott's expedition to Arctic America nevertheless initiated, despite the constraints imposed by geography on accessibility and communications, one of the most intensive periods of natural history collecting in the history of Rupert's Land. His expedition was largely responsible for initiating one of the most substantial private contributions to the Smithsonian natural history collections, and specimens sent out from the Mackenzie River District filled at least twenty cases per year.[308] These specimens

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information on travel arrangements between Fort Garry and St. Paul, SIA, HBC Corr Coll, Folder 8.

[307] Letter from Lockhart to Baird, 17 March 1867, SIA, HBC Corr Coll, Folder 26.

[308] For example, the Arctic Collections received in 1863 (including some specimens from 1862) filled forty boxes and packages, weighing approximately three thousand pounds SIAR, 1863, p.53. The collections received in 1864 filled twenty-nine cases, SIAR, 1864, p.81, and in 1864 R.R. MacFarlane alone sent twenty cases of specimens. See letter from MacFarlane to Baird, 15 May 1865, SIA, RU 7215, Box 14 and SIAR, 1865, p.87. In 1865 the "usual" number (thirty) of cases of specimens were

represented, despite the environmental obstacles encountered, a significant segment of the Smithsonian accessions between 1860 and 1866. In 1862 as much as eighteen percent of the total Smithsonian collections came from the Mackenzie River District, while as much as fourteen percent of the total Smithsonian collections came from the District in 1865.[309]

It is admittedly impossible to determine precisely the number of specimens sent south by the HBC collectors, since nineteenth century record keeping techniques were inadequate to keep pace with specimen collection. The accession records of the Smithsonian Institution itself, would only permit an approximation of the sum total of their collections. In

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sent, letter from W.L. Hardisty to Baird, 4 August 1865, SIA, HBC Corr Coll, Folder 22. In 1866 MacFarlane sent thirty-five boxes of specimens, SIAR, 1866, p.48, and in this year a grand total of forty-nine cases of specimens were shipped to the Smithsonian from Fort Garry. The first thirty-three were shipped in June and weighed 2096 pounds. See letter from James R. Clare to Baird, 6 June and 4 Sept. 1866, SIA, HBC Corr Coll, Folder 8. In 1867, thirty cases of specimens were sent out of the District for the South, although they may not have reached Washington until 1868. See letter written by Thomas Hardisty to Baird, 20 Feb. 1868, SIA, HBC Corr Coll, Folder 21. In 1868 sixteen boxes, eleven packages and one keg were received from MacFarlane alone. SIAR, 1868, p.57.

[309] See Table 4.1 for listing of documentary sources used to determine the number of entries which were submitted by HBC collectors. The information on the total number of entries in the Smithsonian collections have been obtained from the Smithsonian Annual Reports. See SIAR, 1861, p.64; 1862, p.57; 1863, p.58; 1864, p.84; 1865, p.84; 1866, p.45; 1868, p.54; 1869, p.52; 1870, p.46; and 1871, p.42. While the entries derived from Table 5.1 are approximately equal to two or three times that number of specimens, the total number of entries from

Table 4.1

Percentage of specimens submitted/year by the Mackenzie River collectors to the Smithsonian collections

Year	# entries registered by northern collectors	total # entries at Smithsonian	% HBC donations
1859	208	11,691	1
1860	1872	18,192	6
1861	1112	10,686	6
1862	2670	8,689	18
1863	1161	10,962	6
1864		10,196	10
1865	1944	8,325	14
1866	709	7,254	6
1867-1871	323	50,649	.4

Baird's 1862 report on the development of the museum, he

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the Smithsonian Accession Records is, according to Baird's estimate, equal to at least five times the number of specimens. SIAR, 1865, p.85. This assumption is born out by the Accession Records of the U.S. National Museum, wherein many entries represent multiple specimens, for example; Accession number 334, represents skins and eggs of birds sent by C.P. Gaudet from Fort McPherson and Peel River in 1863, or Accession number 79, which represents a box of birds and fishes preserved in alcohol, and sent in by George Barnston in 1862. SIA, RU 699T, Reel 39 and 8. The proportion of HBC specimens in the Smithsonian collections is therefore calculated by multiplying the number of Smithsonian entries by five, and by multiplying the HBC contributions by three, before determining the percentage of HBC donations.

states:

> The cataloguing of specimens in the record books of the Institution has been carried forward during the year by the insertion of nearly 10,000 additional entries, many of them covering each a number of specimens. The present aggregate of entries is about 75,000, embracing at least 500,000 or half a million of specimens. When it is remembered that none of the plants, and insects, and but few of the fishes and invertebrates, have yet been recorded in this way, some estimate may be formed of the extent and value of the material for research in charge of the Smithsonian Institution.[310]

Incomplete statistics did not deter the Smithsonian from annually demonstrating the progress made in augmenting their collections and, at any rate, their calculations erred through omission. The 11,888 entries registered on behalf of the HBC collectors are therefore undoubtedly a conservative estimate of the total numbers of specimens sent out of the Mackenzie River District between 1859 and 1871. Registration numbers, for example, generally indicate types rather than numbers of specimens. Oological specimens, which were the most highly prized acquisitions, were particularly susceptible to exclusion from the Registers. Parent birds were assigned numbers in the registers, but the presence of eggs was often simply noted with the descriptive remarks that accompanied the ornithological specimens. Moreover, large numbers of specimens were collected but never accounted for because HBC collectors had erroneously judged them unfit for the Smithsonian collections.[311] Many

[310] SIAR, 1862, p.56.

specimens were also destroyed through mishandling and through inadequate preservation and storage facilities.

The HBC collectors nevertheless exported significant numbers of natural history specimens, and the collections sent south during the 1860s were certainly the largest ever sent out of Rupert's Land. Their value would be, at any rate, undiminished through reduction. They were important additions to the Smithsonian Museum, and they were important bases for zoological and anthropological research.[312] These collections provide tangible evidence of the rationalization of the processes of data collection produced by the Smithsonian's "Instructions," and they represent some of the first specimens procured through the application of controlled procedures to data collection. The information these collections provided on the flora, fauna and human inhabitants of the north was vastly superior to any other collection, and it also verified earlier zoological lists and pre-ethnographic accounts on northern natural history.

The degree to which the Smithsonian Program succeeded in the north is all the more astonishing when the cumulative effects of limited financial and human resources are added

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[311] Letter from Kennicott to Baird, 29 June 1860, SIA, RU 7215, Box 13.

[312] See Chapter 7 on the anthropological collections sent to the Smithsonian by the HBC collectors.

to the impediments created by distance and terrain. Baird raised two thousand dollars to finance Kennicott's northern expedition,[313] and while this seemed like a grand sum for the times, it was intended to support Kennicott's travel and collecting expenses for three years in the north. Kennicott received no salary, and had barely enough money to purchase rations and clothing from the HBC stores. His passage between Norway House and Fort Simpson, including freight, cost one hundred and twenty dollars alone.[314] But he persevered without complaint. He was not only a trained naturalist, but a zoological zealot, and the small group of northerners who eventually collected for the Smithsonian Institution was immediately attracted to the mysterious "Bugs" Kennicott.[315] Their hospitality, fraternity and cooperation enabled him to meet with success in spite of the frugality of his circumstances, and he spared neither himself, nor others, in his pursuit for specimens.

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[313] Kennicott's expedition was quite different from earlier government sponsored expeditions in that his expedition was funded philanthropically. See Appendix 4 for details of the funding for the collecting expeditions undertaken by Kennicott and Constantin Drexler.

[314] Letter from Kennicott to Baird, 15 June 1859, SIA, RU 7215, Box 13.

[315] J.J. Hargrave, Red River (Montreal: John Lovell, 1874; reprint ed., Altona, Manitoba: Friesen Printers, n.d.), p.246.

Chapter V

COLLECTING AND SOCIAL CLASS

Robert Kennicott's quest for northern specimens met a more than receptive audience. Opportunities for illustrious fur trade careers had been reduced from former times, particularly since the coalition of 1821, when the rigidity of an already highly stratified corporate hierarchy was exacerbated by the union of the Hudson's Bay and North West Companies. Ambitious men were nevertheless anxious to make their mark. Men who might have risen more quickly to positions of power and prestige prior to the coalition, and men who had experienced a personal grievance with the company, became Kennicott's most productive collectors. The personal satisfaction and public recognition associated with scientific activities could compensate for the disappointment arising from retarded fur trade careers, and Kennicott's most important northern collectors substituted these rewards for stifled dreams of corporate success.

The coalition of the Hudson's Bay and North West Companies had resolved the deleterious socio-economic effects of a competitive trade by substituting monopoly for competition. But decreased competition rendered numerous employees redundant, and reduced an already restricted mobility between the "gentlemen" and "servant" classes.[316] Decreased mobility was particularly true if that person was a Rupert's Lander.[317] Before 1821, for example, labourers could work their way through the ranks, or men who signed on with the Hudson's Bay Company as Post Masters could realistically aspire to a clerkship. After the coalition, however, such employees were often relegated indefinitely to a liminal position.

But Europeans could also spend upwards of two decades in the service before being promoted to a clerk or an apprentice clerk. Clerks had the lowest status in the gentleman's clique. They were responsible for the written records of a post, including account books and a "Journal of Daily Occurrences." They were also given charge of posts when their superiors were absent. Many of the men who were given clerkships laboured in this ambiguous position for years, even decades, before receiving promotion. The more privileged positions in the "gentleman's" or middle class became increasingly inaccessible to employees who had entered the service as clerks, and by 1859 company employees could expect to spend an average of fifteen to twenty years as a clerk before receiving recognition for responsibilities

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[316] J.S.H. Brown, Strangers in Blood, pp. 114, 195-96, 200.

[317] Carol Judd, "Employment Opportunities for Mixed Bloods in the Hudson's Bay Company to 1870," H.B.C.A., PAM, pp.1979-21.

assumed seasonally. A clerk could only hope to be promoted to a Chief Trader after at least a decade and a half of dedicated service.

Chief Traders occupied the next step on the hierarchy, and above them were the Chief Factors. The Governor-in-Chief was the chief executive officer in Rupert's Land, and he was directly responsible to the London Committee for fur trade operations in Rupert's Land.[318] The Governor of Rupert's Land exercised his authority through a Council of Chief Factors which met yearly at Norway House. Chief Factors shared in the profits of the trade, and were charged with "... the superintendance of the trade with the Indians and other persons and also of all business relating to the said Concern ..."[319] Chief Traders also had a role befitting their social station, and they were to "... wholly and exclusively act as Traders and conduct the business as such in their respective departments and under the orders and regulations to be from time to time given them respectively by the respective Governors and Councils ..."[320]

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[318] H.A. Innis, Introduction to Minutes of Council Northern Department of Rupert Land, 1821-31, ed. R. Harvey Fleming, Hudson's Bay Record Society, vol.3 (Toronto: The Champlain Society, 1940), p.xiii.

[319] "The Deed Poll" of 26 March 1821 found in Colin Robertson's Correspondence Book, September 1817 to September 1822, Hudson's Bay Record Society, vol.2 (Toronto: The Champlain Society, 1939), p.334.

[320] Ibid., p.335.

Pre-coalition employees had often advanced to the position of Chief Factor within twenty years.[321] Post-coalition traders were often only promoted to Chief Factors well after thirty years' service. Many men, particularly those men who collected for the Smithsonian, expressed their discontent over the excessive periods of service without appropriate advance.

Bernard Rogan Ross, Roderick Ross MacFarlane, James Lockhart, Strachan Jones, George Barnston and Donald Gunn shared several characteristics. They were or had been employed by the HBC, and they were all intelligent and ambitious. More important, however, were their beliefs that they were unappreciated, and that their talents had been

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[321] One of the few examinations of promotion patterns can be found in J.S.H. Brown, "Table 2: Career Lengths and Promotion Patterns among Hudson's Bay and North West Company Officers of 1821," Strangers in Blood, p.119. But since her study only examines the careers of those men who were promoted at the time of the Coalition, promotion patterns of HBC officers have generally been derived from information contained in the Dictionary of Canadian Biography. See volumes: II, "Thomas Bird," 65, Alice M. Johnson; III, "James Isham," 301, E.E. Rich; "Richard Norton," 489-90, Alice M. Johnson; IV, "Samuel Hearne," 339-42, C.S. Mackinnon; "Joseph Isbister," 380-81, S. Van Kirk; "Matthew Cocking," 156-58, Irene M. Spry; "Moses Norton," 583-85, S. Van Kirk; "Humphrey Marten," 517-19, F. Pannekoek; V, "Joseph Colen," 194-95, Shirlee Anne Smith; "Charles T. Isham," 450-51, J.S.H. Brown; VI, "Peter Fidler," 249-52, Robert S. Allen; VIII, "John Ballenden," 59-60, S. Van Kirk; "James Bird," 90-91, John E. Foster; "Joseph Howse," 411-14, H. Christoph Wolfart; "George Keith," 453-54, J.S.H. Brown; "James Keith," 454-55, Philip Goldring; "Donald McKenzie," 557-58, S. Van Kirk; "Roderick McKenzie," 562-63, Elizabeth Arthur; "George Nelson," 652-53, Van Kirk and Brown; "John McLoughlin," 575-81, W. Kaye Lamb; "Alexander Ross," 765-68, F. Pannekoek; IX, "George Gladman," 319-20, W.L. Morton; "James

inadequately recognized. Kennicott had ingratiated himself to both "gentlemen" and "servants," but only a few persons made more than minor contributions to the Smithsonian collections. Aside from MacFarlane, Ross, Lockhart and Jones, none of the other twenty-two collectors stationed in the Arctic or sub-arctic submitted as much as five percent of the total number of specimens sent south.[322]

These four men were also the most persistent collectors of the group. Most northern collectors submitted specimens on fewer than four occasions, and many only submitted specimens during the three years that Kennicott was in the north. Serious collectors, particularly Ross and MacFarlane, abandoned recreational motivations almost

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Hargrave," 364-66, Van Kirk; "John Peter Pruden," 648-49, W.H. Brooks; "James Anderson," 5-6, C.S. MacKinnon; "John Bell," 42-43, Joan Craig; "Peter Warren Dease," 196-99, William R. Sampson; "James Robert Clare," 130-31, Joan Craig; "William Mactavish," 530-31, N. Jaye Goossen; X, "Alexander Christie," 167-68, Hartwell Bowsfield; XI, "A.K. Isbister," 445-46, Van Kirk; "Richard Hardisty," 383-84, Shirlee Anne Smith; "John Tod," 881-83, Madge Wolfenden; "William Fraser Tolmie," 885-88, W. Kaye Lamb; "Andrew G. Ballenden Bannatyne," 44-47, J.E. Rea; "William Kennedy," 470-71, Edward Charles Shaw; "Andrew McDermot," 545-46, Barry Hyman; "John McLean," 569-70, Garron Wells; "Alexander Caulfield Anderson," 16-18, W. Kaye Lamb.

[322] Tables 5.1 and 5.2 illustrate the number of specimens sent south per collector, the total number of specimens sent south from the Mackenzie River District, and the percentage of the total collections sent by each individual collector. Table 4.1 has been constructed on the basis of data obtained from the following sources: "List of Species Collected at Fort Simpson, 1860 and 1861" by B.R. Ross, The Anderson Papers, H.B.C.A., PAM, E.37/13. Also "Collected Notes, Lists and Catalogs on Birds," SIA, RU 7215, Box 13, Robert Kennicott; Box 29, Folder: B.R. Ross; Box 14, Roderick Ross MacFarlane; Box

immediately. They believed that their activities were advancing the "cause of science." Whether they collected the specimens themselves, or paid for native assistance, they felt that they deserved status commensurate with their contributions. They developed many of the attributes that characterized the scientific community. Just as scientists exchanged the products of their intellectual activity for peer recognition, they too both expected and enjoyed recognition.[323] Publications, memberships in scientific societies, formal acknowledgement of their contributions in Smithsonian publications, and the satisfaction derived as a result of the personal friendship extended to them by a relatively elite group, were important achievements in their own right, but they were also rather obvious substitutes for the corporate success denied them.

13, S. Jones; Box 9, Charles P. Gaudet. Information on Gaudet's collection was also found in a letter he wrote to Baird, 17 July 1862, SIA, HBC Corr Coll, Folder 18. Information on specimens submitted is also found in a letter from L. Clarke to Baird, 1 Dec. 1862, SIA, HBC Corr Coll, Folder 9. Official Smithsonian records (exclusive of the anthropological records - see next note) were also used to arrive at the numbers in Table 4.1, and these are contained in the Accession Records, Office of the Registrar, United States National Museum, and found in RU 305, on Reels 8 and 39. Information from the Reports of the Assistant Secretary found in the SIAR, 1857-66, was also used to compile Table 4.1. The entries derived from the Annual Reports are easily spotted since they are always indicated by "some."

[323] See Chapter 8 for discussions about the structure of the nineteenth century scientific community, and about the roles of scientists, collectors and hobbyists within that community.

Some HBC traders were therefore prime candidates for the Smithsonian Program. Robert Kennicott, a young naturalist from Illinois, provided their first personal connection with the world of science, and his devotion was both obvious and inspiring. He was passionately committed to the study of natural history. Endless hours spent in makeshift laboratories and in the field proved his sincerity and assured northerners, as nothing else could, that collecting was important. Baird also assured his northern correspondents that collecting natural history specimens was important to science. And the importance of science was self-evident. Baird and Kennicott were honestly grateful for the specimens sent south by the HBC collectors, and they willingly acknowledged their contributions.

Robert Kennicott was well suited to the task given him. He convinced both trader and trapper to collect for the Smithsonian, but when honourable attempts failed to motivate the less well educated northerners to collect for the "cause of science," Kennicott did not hesitate to employ bribery and intimidation to achieve his ends. He had been sent north to accumulate specimens for the Smithsonian Institution, and he would not return empty-handed.

Table 5.1

Numbers of Specimens/year sent from the Arctic to the Smithsonian Institution

	Specimens submitted per year									Total per Collector
	1859	1860	1861	1862	1863	1864	1865	1866	1867-71	
R.R. MacFarlane		8	62	550	1000	1520	1830	463	283	5716
B.R. Ross		840	502	774	some			138	some	>2260
R. Kennicott	208	572	428		47	30		62	23	1370
J. Lockhart		78	4	980	some	67	some	1	1	>1131
S. Jones				76			some		525	> 601
C.P. Gaudet			2		some		133	45	1	> 179
A. Mackenzie		142	1							143
J. Reid		102	41		some					> 143
W.L. Hardisty		some	55		some				8	> 63
A. Flett			1		57					> 58
W. Brass		7			36					43
J.Flett		35	some	6	some		some			> 41
J. Hope		43								43
J.S. Onion		27	some		some					> 27
N. Taylor		11	10							21
Lockhart/Flett/Sibbeston					13					13
A. Hoole				10						10
J. Sibbeston					8					8
Mrs. C. Ross		1	6							7
J. Dunlop		6								6
F. Boucher				4						4
R. McDonald									1	1
T. Swanston		some								some
Mrs. Hardisty		some								some
W.W. Kirkby		some								some
J. McDougall									some	some
L. Clarke		some	some		some					some
R. Campbell		some	some							some
Total/year	208	1872	1112	2670	1161	1653	1963	709	842	11888

Table 5.2

Individual Contributions to the Northern Collections sent to the Smithsonian Institution, 1859-71

Collector	number of years specimens submitted	total number of specimens collected	percentage of total Mackenzie River collection
R.R. MacFarlane	8	5716	48
B.R. Ross	6	2260	19
R. Kennicott	7	1370	11.5
J. Lockhart	8	1131	9.5
S. Jones	6	601	5.1
C.P. Gaudet	5	179	1.5
A. Mackenzie	2	143	1
J. Reid	4	143	1
W.L. Hardisty	3	63	.5
A. Flett	2	58	.5
W. Brass	2	43	.4
J. Flett	6	41	.3
J. Hope	?	?	?
J.S. Onion	3	27	.2
N. Taylor	2	22	.2
Lockhart/Flett/ Sibbeston	1	13	.1
A. Hoole	?	?	?
J. Sibbeston	1	8	.1
C. Ross	2	7	.1
J. Dunlop	1	6	.1
F. Boucher	?	?	?
R. McDonald	1	1	.01
T. Swanston	1	?	?
Mrs. W. Hardisty	1	?	?
W.W. Kirkby	?	?	?
J. McDougall	?	?	?
L. Clarke	3	?	?
R. Campbell	2	?	?

Robert Kennicott (1835-1866) first developed his interest in natural history through his father, Dr. John Kennicott. Kennicott Senior was more noted for his contributions to horticultural science than he was for his medical practice, and Robert's entrance into the scientific community also came through his father's encouragement to study natural history.[324] Dr. Kennicott petitioned his colleagues to instruct his son, and consequently Robert studied physiology under Dr. Daniel Brainard, a member of Rush Medical College, and ornithology under Dr. P.R. Hoy of Wisconsin. Kennicott had also, by 1856, both directly and indirectly established contact with Baird at the Smithsonian.[325] The experimental results of his studies on rattlesnake venom, which he had conducted under the auspices of Brainard, were published in the Smithsonian's Annual Report and he had, on the advice of Dr. J.P. Kirkland of Cleveland, established a correspondence with Baird.

Ultimately, it was Dr. Kirkland who was responsible for Kennicott's interest in the north. Kirkland, who was a close friend of John Kennicott and another of Robert's tutors,

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[324] Biographical information on Kennicott is from James Alton James, "Introduction," The First Scientific Exploration of Russian America and the Purchase of Alaska (Chicago: Northwestern University, 1942), pp.1-18.

[325] Lucy Baird's manuscript states that Kennicott went to Washington to study at the Smithsonian in 1854, and that he had then already corresponded with her father for many years. This is unlikely, and her manuscript is vague on the events that occurred between 1854 and Kennicott's return from Red River in 1857. PAM, MG1 B18, p.1.

suggested that Russian America, or the Hudson's Bay Company territories, would hold unsurpassed potential for natural history studies since it contained numerous unidentified zoological species. Kirkland assigned Captain Cook's A Voyage to the Pacific Ocean and George Simpson's Overland Journey Round the World as part of Kennicott's natural history curricula.[326] Both narratives contained invaluable information. They contained factual data on the geography, topography, natural history and inhabitants of the regions visited by Cook and Simpson, as well as providing a framework for future studies of the north. These books exemplified a genre that was both accessible and informative, and they provided data on northern and western Rupert's Land not found in Fauna Boreali-Americana or elsewhere.

By 1859 Kennicott had also acquired experience, and had established a reputation as a field naturalist. He had been selected by the Illinois Agricultural Society to collect zoological specimens for exhibit at the Chicago Fair, and these specimens were forwarded to the Smithsonian Institution following the fair.[327] The results of these

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[326] This information is found in J.A. James, p.1 f.n., although Cook's book is incorrectly entitled Vancouver. James cites a letter written by Kirkland supporting the claim that Kirkland was responsible for the development of Kennicott's career as a northern naturalist. Letter of Dr.. Kirkland, 5 April 1867, Executive Documents, 2nd Session, 40th Congress, no. 177, p.31.

[327] The Smithsonian received a portion of Kennicott's collection because it had helped finance his field studies. SIAR, 1856, p.46.

early expeditions were subsequently published and his articles on "The Quadrupeds of Illinois, Injurious or Beneficial to the Farmer,"[328] were received favourably by American scientists.[329] Kennicott was thereafter no mere collector, but a member of the scientific community. By 1858, after having collected natural history specimens for Northwestern University, he was made Curator of that university's new Natural History Museum.

In the summer of 1857 Kennicott had agreed to collect zoological specimens for Northwestern, and after deciding to "secure specimens from as wide a geographical range as possible," Kennicott joined the convoy of Red River carts travelling from St. Paul to the Red River Settlement.[330] Kennicott spent four months in Red River, and while there he met Donald Gunn.[331]

Gunn (1797-1878) was an outspoken critic of the HBC's policies in the northwest, and he had been one of the many casualties associated with the union of the HBC and North West Company in 1821.[332] The rationalization of the fur

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[328] Patent Office Agricultural Reports, for 1856, 52-110 and 1857, 72-107.

[329] J.A. James, The First Scientific Exploration of Russian America, p.3.

[330] Ibid., p.4.

[331] Kennicott had also met William Mactavish, as well as Alexander and Donald Murray sometime before 1859, and it is likely that he met these men while at Red River in 1857.

[332] L.G. Thomas, "Donald Gunn," in Dictionary of Canadian

trade which accompanied the amalgamation of the companies had created a surplus of labour, and Gunn's services were terminated, just nine years after his arrival in Rupert's Land.[333] Gunn had left Scotland in 1813 and joined the HBC as a labourer, but in 1822 he was discharged from his posting at Severn.[334] He settled in St. Andrew's Parish where he farmed for ten years before taking on the positions of teacher at the Church Missionary Society school, and librarian of the Red River community library.

Gunn had received some education in Scotland and in addition to eventually becoming one of the Settlement's first historians, he became interested in the Smithsonian and science during the 1850s.[335] Extant correspondence between Gunn and the Smithsonian is dated as early as 7 June 1855, but Gunn had obviously established contact sometime earlier since this letter accompanied a meteorological register that he had kept for the Smithsonian.[336] Specimens submitted by Gunn had reached the Smithsonian by the following October, and again in April 1856.[337] By early 1856

Biography, vol.10, p.324.

[333] Servant's Accounts, H.B.C.A., PAM, B.239/g/2.

[334] H.B.C.A., PAM, A.16/37, fo.110.

[335] Gunn coauthored a history of the province of Manitoba with Charles R. Tuttle, History of Manitoba (Ottawa, 1880).

[336] Letter from Donald Gunn to Baird, Incoming Correspondence, Assistant Secretary, 1850-77, SIA, RU 52, Box 7, vol. 2, p.329.

[337] Baird wrote Gunn acknowledging receipt of his specimens

Gunn had already asked some of his "friends to the north" to collect on Baird's behalf.[338] Gunn's dedication to natural history grew throughout the following decade but it never equalled the intensity of his anti-HBC campaign, and he made his priorities quite clear to Baird in 1858:

> My letter to you had been written before the Decr Mail left but got mislaid so that I could not, at the time, lay me hand on it and being now thus occupied with business of a political character which would not admit of delay - I could not command time to write another - and as I have found my original letter I send it by the Mail which is to leave on the 13th Inst. Much of my time has been occupied during the last year and is likely to be so for some time to come in writting [sic] on the Hudsons Bay question - For we are determined to do all in our power to blot out the last remnant of this Despotic rule of the House of Stuart - and to have [?] Country emancipated from the Iron bondage of the Fenchurch street Nabobs to Unite it to Canada and have it opened up to civilization with all its ameliorating blessings _"[339]

Gunn was one of Kennicott's first northern acquaintances but he was indicative of Kennicott's future sources of support in the north. Gunn was one of the most vehemently anti-company men that Kennicott was to meet, but his sense of injustice and grievance was shared to some extent by all of Kennicott's most productive trader-collectors. Kennicott

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on 11 Oct. 1855 and 10 April 1856. Assistant Secretary and Secretary Correspondence Registers, 1854-61, SIA, RU 57, Box 2.

[338] Letter from Gunn to Baird, 20 Feb. 1856, SIA, RU 305, Reel 6.

[339] Letter from Gunn to Baird, 11 Jan. 1858, found in Accession Records, Office of the Registrar, U.S. National Museum, SIA, RU 305, Reel 7.

stayed with Gunn for a few days in September 1857 and at that time took the opportunity to give him, some "... useful lessons for collecting and preserving all sorts of Creatures."[340] Unfortunately, these lessons coincided with a request for collections on behalf of a "Gentleman in Edinburgh" and Gunn felt compelled to respond to this request, since it came from the HBC who he referred to as his "superiors."[341] Gunn nevertheless managed to send specimens to the Smithsonian in 1857 and continued to send specimens south with regularity for the next decade.[342] His northern location and his dedication to natural history made Gunn a highly valued addition to the developing corps of Smithsonian field workers, and Baird was appreciative of Gunn's position and his contribution. It was no doubt gratifying to be needed, and this was perhaps particularly true of Gunn who had been stripped of his livelihood within a decade of his arrival in Rupert's Land.

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[340] Letter from Gunn to Baird, 26 Nov. 1857, SIA, RU 305, Reel 6.

[341] This man was probably Andrew Murray (1812-1878), a Scottish naturalist and collector often referred to in Ross' correspondence. Murray was a Fellow of the Royal Society, Edinburgh, President of the Edinburgh Botanical Society (1858), Secretary of the Royal Horticultural Society (1860), and a collector for the Industrial Museum of Scotland (later the Royal Scottish Museum). See _The Dictionary of National Biography: The Concise Dictionary_, Part I, _From the Beginnings to 1900_ (Oxford University Press, 1961), p.920; and Robert Kerr, "For the Royal Scottish Museum," _The Beaver_, June 1953, pp.32-35.

[342] Gunn missed sending specimens on only three occasions over a ten year period. See Appendix 8.

Kennicott's brief visit to Rupert's Land was no doubt one of the many factors leading towards his second expedition to the Mackenzie River District in 1859. However Kennicott's personal acquaintance with the more southerly portions of Rupert's Land was of no greater importance to the northern expedition than was Baird's desire to acquire the largest, and most comprehensive series of North American natural history specimens yet assembled. The Arctic's role in the realization of Baird's dream was perhaps obvious, if ill-defined from the reports of Sir John Richardson, and Kennicott's idea to actually travel north and personally gather specimens was greeted enthusiastically by Baird.[343]

The young naturalist left Chicago on 28 April 1859.[344] Kennicott decided to travel from Chicago to Fort Garry via Toronto, Sault Ste. Marie and Fort William rather than take the more expensive route through St. Paul.[345] Upon his arrival in Toronto he met with Dr. John Rae, whose fame as a surgeon and explorer with the HBC and on the Franklin searches was well established. He also met with Mr. Dawson.[346]

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[343] J.A. James, The First Scientific Exploration of Russian America, p.6, and Manuscript excerpt from Lucy Baird's biography of her father, PAM, MG1 B18.

[344] Letter from Kennicott to Baird, 21 April 1859, Spencer F. Baird Papers, 1833-1889, Incoming Correspondence, SIA, RU 7002, Box 27.

[345] Letter from Kennicott to Baird, 19 April 1859, SIA, RU 7002, Box 27.

[346] It is unclear whether he met with Simon, who had been a surveyor on the Hind Expedition to the Northwest, or if

Throughout his northern travels Kennicott demonstrated great facility in judging character, and he seldom erred in his assessments of where a favour might reap the greatest return for the scientific activities he had undertaken on behalf of the Smithsonian Institution.[347] Having met with Rae, he wrote Baird requesting that the Assistant Secretary write Rae directly, to put in a good word about his expedition because, as Kennicott put it, Rae was "pretty influential in the company."[348] Kennicott was so impressed by Rae that he also asked Baird to loan him the money for two zoological books which he intended to give Rae as gifts so as " ... to get on well into his good graces!!"[349] Kennicott unfortunately thereafter lost touch with the northern explorer and the Smithsonian benefited little from this brief encounter.

More important to the Smithsonian researches was Kennicott's chance meeting with Chief Factor George Barnston (1800-1883). Kennicott met him while travelling aboard the steamer Rescue from Collingwood to Fort William. Barnston had just returned from furlough and was on his way to

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he met with J.W. (William) Dawson, who was a palaeobotanist associated with the Geological Survey of Canada and the Principal of McGill University at this time.

[347] In some cases he was outright manipulative in his pursuit of specimens; for example see discussions on his relationships with northern Indians in Chapter 6.

[348] Letter from Kennicott to Baird, 2 May 1859, SIA, RU 7002, Box 27.

[349] Ibid.

Michipicoten, where he would work out his last commission with the HBC as officer in charge. Barnston had been promoted to Chief Factor in 1847, fully twenty-seven years after first entering the trade with the North West Company, and continued as a Chief Factor until 1863 when he retired to Montreal.[350] He had a jaded career with the HBC. He once resigned from the company following a dispute with George Simpson over a promotion denied him in 1831, but he rejoined the company one year later. Similarly, the furlough from which he was just returning when Kennicott met him had been requested in order to distance himself from the problems encountered as a result of competition in the north west.[351]

Barnston had long been keenly interested in scientific activities and displayed great curiosity about Kennicott's expedition.[352] He had himself been engaged in a surveying expedition of the Columbia District soon after he joined the Company, and he had apparently been educated in Scotland as a surveyor and army engineer.[353] He had previously exhibited great enthusiasm for scientific activities, and had donated his entomological collection to the British Museum following a visit there in 1843-44. By 1857 he had become a prolific

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[350] Jennifer S.H. Brown and Sylvia Van Kirk, "George Barnston," in Dictionary of Canadian Biography, vol.11, pp.52-53.

[351] Ibid.

[352] Letter from Kennicott to Baird, 7 May 1859, SIA, RU 7002, Box 27.

[353] J.S.H. Brown and Sylvia Van Kirk, "George Barnston," in Dictionary of Canadian Biography, vol.11, pp.52-53.

contributor to scientific journals including the Canadian Naturalist and Geologist, the Canadian Naturalist and Quarterly Journal of Science and Ibis. He was also an active member of the Natural History Society of Montreal, and he became a fellow of the Royal Society of Canada in 1882.

Kennicott was pleased by Barnston's interest in his expedition and held the well-seasoned trader in high esteem. He characterized Barnston as an "accoplished [sic] naturalist" who was "thoroughly honest" and he resolved to divert his collecting activities towards the Smithsonian. Barnston had already deposited natural history specimens with the British Museum, McGill University, the Royal Industrial Museum of Scotland and the Canadian Geological Museum,[354] and so Kennicott repeated the tactic which he had used with Rae. He asked Baird to send Barnston a package of books, specifically Baird's Catalogue of North American Mammals, chiefly in the museum of the Smithsonian Institution and Catalogue of North American Birds, chiefly in the museum of the Smithsonian Institution (volumes eight and nine of the Pacific Railroad Survey Reports, 1857 and 1858), as well as the Catalogue of the described Diptera of North America, Smithsonian Institution, 102, 1859, and his own article on "The Quadrupeds of Illinois, Injurious or Beneficial to the Farmer," Patent Office Agricultural Reports for 1856. He hoped that these publications would

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[354] Brown and Van Kirk, Ibid.; George A. Dunlop and C.P. Wilson, "George Barnston," in The Beaver, Dec. 1941, 16-17, and Bernard Rogan Ross Notebook, SIA, RU 7221.

induce Barnston to collect for the Smithsonian. But they were also an expression of his gratitude. Barnston had facilitated Kennicott's voyage immeasurably by granting free passage on the HBC's canoes travelling from Fort William to meet Governor Simpson at Norway House, and Barnston had also arranged a "certificate of deposit" for £ 142.12.5 sterling while at Sault Ste. Marie, which allowed Kennicott to "raise money anywhere in the Fur Co.'s possessions."[355]

Kennicott was anxious to get on to Fort Garry, pick up his mail and meet with William Mactavish, Governor of Assiniboia,[356] but delays due to inclement weather near the vicinity of Fort William made it necessary for the canoes to go directly to Norway House. Kennicott and his companion, Mr. Charles Hubbard of Milwaukee, left Fort William with the brigade on 18 May, but soon after their departure Kennicott decided to go on to Norway House alone.[357]

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[355] Barnston's assistance to Kennicott with regards to transportation on HBC vessels is first referred to in Kennicott's letter to Baird of 7 May 1859, but it is discussed more fully in his letter to Baird of 9 May 1859. SIA, RU 7002, Box 27, as is the information on Kennicott's financial arrangements.

[356] Letter from Kennicott to Baird, 9 May 1859, SIA, RU 7002, Box 27.

[357] Hubbard was the ward of Increase Lapham (1811-1875), who was a scientist and geologist for the state of Wisconsin (1873-75). In 1845 Lapham published a book called <u>The Antiquities of Wisconsin</u> which Bernard Rogan Ross referred to in support of his theory of aboriginal migrations across Bering Straits and down the waterways of the coastal region. See Chapter 7 for a fuller discussion of this topic. Biographical information on Hubbard is found in Kennicott's letter to Baird, 18

The brigade arrived at Norway House on 12 June, beating George Simpson's arrival by one day.[358] Simpson's presence at Norway House was warranted by the Council meeting held there annually, and Kennicott met with Simpson while waiting for the Portage La Loche Brigade to take him north with the HBC trade goods. Kennicott needed to complete and confirm the details for the remainder of his journey in Rupert's Land, but Simpson was less congenial than his former host. Barnston had granted free passage to Kennicott, his dog, his companion and three hundred pounds of baggage as far as Norway House, but Simpson would not permit the same arrangement for the voyage from the distribution centre on Lake Winnipeg to Fort Simpson.[359] He offered free passage to York Factory in Company craft, but he would not contravene the rules of Council in relation to the difficult journey to the Mackenzie River District.[360] Simpson's determination to

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April 1859, Collected Notes, Lists and Catalogues on Birds, Robert Kennicott, SIA, RU 7215, Box 13. Also see SIAR, 1859, p.66, and the biographical information on Lapham comes from *Who was Who in America*, Historical Volume, 1607-1896, Revised Ed. 1967 (Chicago: Marquis Who's Who, 1967), p.373.

Hubbard only went as far as Fort Alexander, and from there made his way back to the United States, taking with him a number of natural history specimens that had been collected by Donald Gunn. SIAR, 1859, p.66. Information on specimens comes from the SIAR, 1859, and information on their travels comes from letters written by Kennicott to Baird, 16 May 1859 and 18 May 1859, SIA, Ru 7215, Box 13.

[358] Letter from Kennicott to Baird, 15 June 1859, SIA, RU 7215, Box 13.

[359] Letter from Kennicott to Baird, 16 May 1859, SIA, RU 7215, Box 13.

adhere to the rules was no doubt strengthened by the fact that the brigade taking Kennicott to the Mackenzie River District was also carrying other paying passengers. Mr. W.W. Kirkby, a clergyman with the Church Missionary Society, his wife Eleanor, and their two children also travelled aboard the company boats to Fort Simpson.

Simpson was most interested in Kennicott's expedition and, upon meeting the naturalist personally, he offered the services of HBC posts and personnel to him. Kennicott was exempted by Resolution of the Northern Council from charges for board and lodgings, although he was responsible for all costs related to his personal outfit.[361] Kennicott therefore had to pay for transportation, his baggage and freight (with the exception of books which Simpson allowed as free freight), and he was responsible for the salaries of hired help.[362]

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[360] Simpson's position is stated in a letter from Kennicott to Baird, 15 June 1859, SIA, RU 7215, Box 13, and it reflected Resolution 70 of the "Standing Rules and Regulations of the Honorable Hudson's Bay Company" of the Northern Council, in which the Council stipulated that missionaries and "strangers" travelling on company boats be charged 5p, with the costs of shipping freight and baggage be priced according to the established tariff. Minutes of Council, 1843-66, H.B.C.A., PAM, B.239/k/24.

[361] Resolutions 76 and 77, Minutes of Council, Northern Department, 1859, H.B.C.A., PAM, B.239/k/13.

[362] Most of this information comes from a letter written by Kennicott to Baird, 15 June 1859, SIA, RU 7215, Box 13, with the exception of the information on the special arrangements made for written material which is referred to in a list of articles appended to Kennicott's letter to Baird, 18 June 1859, SIA, RU 7215, Box 13.

Simpson had of course already consented to Professor Henry's request for permission to conduct scientific studies in HBC territories, and he had also offered to send instructions and a general letter of introduction to Governor William Mactavish and other HBC officers regarding Kennicott's expedition. The HBC was favourably disposed to the Smithsonian request for permission to conduct scientific explorations in Arctic America because Joseph Henry's request was supported by Lord William Napier, the British Ambassador to the United States.[363] Kennicott went north armed with a letter of introduction from HBC Governor George Simpson, and a "Circular" addressed to HBC employees as "friends of science."[364] The letter was to ensure that Professor Henry's specimen needs were met by "... secure[ing] to Mr. Kennicott a friendly welcome and personal attention wherever he may fall in with any of them"[365] and the Circular outlined the Smithsonian specimen needs in the Arctic region.[366]

Kennicott was very grateful for Simpson's interest and cooperation and so repeated his earlier request to Baird. Kennicott knew the utility of reciprocity in fostering good

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[363] Letter from Napier to Simpson, 19 March 1859, H.B.C.A., PAM, D.5/48, fo.403.

[364] Letter from Simpson to B.R. Ross, 15 June 1859, H.B.C.A., PAM, B.200/b/34.

[365] Letter from George Simpson to Professor Henry, 28 March 1859, SIA, HBC Correspondence Collection, Folder 38.

[366] "Circular to Officers of the Hudson's Bay Company," Smithsonian Miscellaneous Collections, 137, vol. 7-8.

relations, and like his mentor he seldom failed to transform his personal gratitude, promises of public recognition, or material gifts into good will and great collections. He therefore asked Baird to send Simpson some books and specimens, just as requested previously. Kennicott asked Baird to sent duplicates from the specimens he had on hand at the Smithsonian for George Simpson's private museum at Lachine, and he asked him to place the Governor's name on the mailing list for the Smithsonian and Patent Office Reports.[367] These gifts were intended to not only repay past efforts, but induce future cooperation on behalf of the Smithsonian. Although both free trader and explorer had travelled throughout the northwest virtually unopposed for some time, Kennicott did what he could to nurture the Governor's support and ensure a Smithsonian destination for northern specimens. The Smithsonian scientists generally had but limited funds for their projects, and they valued any assistance obtained in the field.

The Company boats carrying Kennicott, the Kirkby family and Fort Simpson's new clerk, Julian S. Onion, navigated the waters of the well-established route which passed through Cumberland House, reaching Methy Portage on 25 July.[368] The Mackenzie River Brigade arrived on the same day, accompanied by Chief Trader Bernard Rogan Ross

[367] Letter from Kennicott to Baird, 15 June 1859, SIA, RU 7215, Box 13.

[368] Letter from Kennicott to Baird, 27 July 1859, SIA, RU 7215, Box 13.

(1827-74).[369]

Ross had been stationed in the Mackenzie River District for twelve years, but he had emigrated to Canada in 1843.[370] He left his home in Londonderry, Ireland, for a new one at the age of sixteen, and he wanted to return home after spending his first winter in Montreal unemployed and living with a clergyman. But his chances for employment were equally poor in Ireland. His uncle, Francis Rogan, consequently wrote Isaac Calhorn, an acquaintance of Governor George Simpson, asking him to recommend Ross' services to the Hudson's Bay Company. Rogan felt Ross had the necessary attributes for life in the northwest:

> His residence in Canada for the last winter has accustomed him to the climate. He is healthy; intelligent; and well disposed. He writes a good hand; is a very fair Accountant; and he had, before leaving home, a tolerable knowledge of french, which has [his?] no doubt, improved ...[371]

In 1843 Ross was appointed apprentice clerk at Norway House.[372] Ross then spent one winter at Fort Frances in the Lac la Pluie District, and one year at York Factory. In 1847 he began his fifteen year sojourn in the Mackenzie River District, and although he was regularly stationed at Fort

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[369] Ibid.

[370] See Hartwell Bowsfield, "Bernard Rogan Ross," vol. X, Dictionary of Canadian Biography, ed. Marc La Terreur (Toronto: University of Toronto Press, 1972), p.629, for brief biography of Ross.

[371] Letter to Isaac Calhorn from Francis Rogan, 27 March 1843, PAM, H.B.C.A., E.31/1.

[372] Minutes of Council, Northern Department, 1832-50, H.B.C.A., PAM, B.239/k/2.

Simpson, he also spent time at Forts Norman, Liards and Resolution.[373]

Ross was made a Chief Trader in 1856, a mere twelve years after he began his career with the HBC, but he never advanced beyond that rank. He felt that he had been passed over for promotion because of an unsanctioned relationship with an Indian woman dating to 1856.[374] Ross suffered attacks on both his personal character and employment capabilities. As W.L. Hardisty, one of his fellow officers, noted:

> - the officers of MKR have been greatly scandalized of late, by one of our colleagues keeping a mistress - and not being certain when I might be allowed to leave this district I considered it better to marry even an ignorant girl, than pine away in solitary misery at the Youcon [sic] - or disgrace myself, and the service to which I belong, by imitating the example set us by Mr C.[hief] T.[rader] Ross.-[375]

Such reproaches were hardly surprising in light of Victorian norms and Simpson's attitude towards native-European alliances. Simpson attempted to regulate native-trader alliances because they were a drain on company resources, but he was also personally opposed to such relationships. He believed that natives were inferior to "whites," and it was his antagonism to mixed alliances that made abstinence

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[373] Minutes of Council, Northern Department, 1851-70, H.B.C.A., PAM, B.239/k/3.

[374] Letter from Ross to Simpson, 14 Dec. 1857, H.B.C.A., PAM, D.5/45, fos. 460-463.

[375] Letter from W.L. Hardisty to Governor Simpson, 10 Nov. 1857, H.B.C.A., PAM, D.5/45, fo.263.

preferable, but discretion a prerequisite for promotion. Only "civilized" men could aspire to a commissioned post, and as the author of the above comments obviously recognized, civilized men generally married "civilized" women.[376] Hardisty managed to avoid "scandalizing" himself or the Company by marrying a local native woman, but he attempted to ensure his future prospects with the Company by proposing that she go to Canada to be educated. He felt that three or four years of education would improve her sufficiently so as to "enable her to mix in decent [?] society, and to do credit to my rank in the service."[377]

Ross recognized the necessity to conform, but his assessment of the company's view of European-Indian liasons was misguided and perhaps ill-timed. He thought that he could overcome what he perceived as unjustified prejudice against his advancement by simply replacing his Indian mistress with a proper wife.[378] But social mobility had been restricted severely since 1821 when competitive trade had been replaced by monopolization. Ross misjudged his situation completely and his marriage to Christina, the daughter of Chief Factor Donald Ross, in 1860 did little to advance his career. He retired from the service in 1866, never having risen above the rank of Chief Trader.

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[376] Brown, Strangers in Blood, pp. 127, 147-50, 200-05.

[377] Letter from Hardisty to Simpson, 10 Nov. 1857, H.B.C.A., PAM, D.5/45, fo.264.

[378] Letter from Ross to Simpson, 3 May 1858, H.B.C.A., PAM, D.5/46. fo.499.

Ross received furlough in 1863, and he spent it travelling south and abroad. On 27 March 1863 Ross arrived at the Smithsonian Institution.[379] He spent a week in Washington before leaving to visit his in-laws in Upper Canada, and then reuniting with his wife and family in Red River. From there they departed for Europe. The Ross family visited London, Dublin and Edinburgh before returning to Canada, and while in the British Isles Ross visited the museums with which he had corresponded.[380]

Once home, Ross was stationed at Mingan, Quebec. He was then appointed to the Rupert's River District.[381] In 1866 he was stationed at Rupert's House, and stayed there until he was placed in charge of Fort Alexander.[382] While at Fort Alexander, Ross became so utterly dismayed with what he considered as infractions upon his authority, that he "requested leave of absence for [the] next year previous to retirement."[383] Ross also felt provoked into requesting leave out of a fear that Donald Smith's proposed reorganization of the Deed Poll would reduce his wages.

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[379] Memo from Ross to Baird, 28 March 1863, SIA, HBC Corr Coll, Folder 36.

[380] Letter from Ross to Baird, 20 Sept. 1863, SIA, HBC Corr Coll, Folder 36.

[381] Letters from Ross to Baird, 28 May 1864 and 14 July 1865, SIA, HBC Corr Coll, Folder 36.

[382] Letter from Ross to Baird, 12 August 1866, SIA, HBC Corr Coll, Folder 36.

[383] Letter from Ross to William MacMurray, 5 Dec. 1870, The McGowan Collection, H.B.C.A., PAM, E.61/16, fos. 58-59.

Ross retired from the HBC and settled with his family, who were already living in St. Andrew's Parish of the Red River Settlement. He owned Brookside Store and was the agent for "London and Lancashire Life Assurance Company and Lake Superior Royal Mail Line of Steamers."[384] He was a substantial landowner in St. Andrew's Parish,[385] and became active in community politics.[386]

Ross, no less than Gunn, had limited success in his career with the company. He had always been anxious about his lot in life. His rank was undoubtedly a personal embarrassment, particularly in view of the career success of his mixed blood colleague, William L. Hardisty. He deplored the lassitude of northern life. He had constantly attempted to alleviate the dullness associated with life in the fur

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384 PAM, MG14 C21 Box 9.

385 Ross owned lots 116, 117 and 118, as well as being partial owner, with Elizabeth and Isabella Douald [sic], of lot 95. These lots were all on the west side of the river. He also owned the northern half of lot 439 (HBC survey) on the east side of the river. See, St. Andrew's Parish Surveys, PAM, RG17 D2 Box 35.

386 He acted as secretary, to a meeting of St. John's and Kildonan Parishes (12 October 1869), and wrote James Ross, delegate for Kildonan Parish, informing him that the Parishioners favoured the installment of Lieutenant-Governor MacDougal in Red River. Ross, and other members of the county of Lisgar, later petitioned Governor-General Morris on behalf of "half-breed" land rights, and soon after (both petitions were served in 1872-73) Ross petitioned Lieutenant-Governor Archibald in favour of Louison L'Etendre. This petition asked that L'Etendre not be made to pay the full penalty for his treasonous actions regarding the "Fenian Invasion of British Territory." Alexander Morris Papers, PAM, MG12 B1 Item 542; Archibald Papers, Despatch Book #3 and #5, PAM, MG12 A1.

trade by filling his leisure hours with activities that were intellectually stimulating, as well as entertaining.[387] He fancied himself an accomplished vocalist,[388] and he tried his hand at poetry and journalism.[389] He loved to read history, philosophy, poetry, novels and biography. He had a library of five hundred volumes, and he also had access, afer 1852, to the Mackenzie River District Library and the Officers Proprietary Library. But it was only after he had established a correspondence with Baird that he substituted his preference for literature with a predilection for science, and he passionately consumed the many scientific journals, articles and monographs that Baird sent him.

The shift to science symbolized more than a subtle substitution of one literary genre for another. Contact with Kennicott, Baird and the Smithsonian refocused Ross' life. He had never doubted his authority or power and he did not hesitate to share his delusions, even with Baird:

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[387] Debra Lindsay, "The Hudson's Bay Company-Smithsonian Connection and Fur Trade Intellectual Life: Bernard Rogan Ross, a Case Study," in _Le Castor Fait Tout_, Selected Papers of the Fifth North American Fur Trade Conference, 1985, eds., Bruce Trigger, Toby Morantz and Louise Dechene (Montreal: Lake St. Louis Historical Society, 1987), pp.587-617

[388] Kennicott wrote that Ross had sung to him for two solid hours one evening, and that episode had been very taxing on their relationship. Letter from Kennicott to Baird, 8 July 1861, SIA, RU 7215, Box 13.

[389] Ross recorded local gossip in the _Athabasca and English River Inquirer_, See B.R. Ross, "Fur Trade Gossip Sheet," _The Beaver_, Spring 1955, p.52. Examples of his poetry can be found in the McGowan Collection, H.B.C.A., PAM, E.61/2, fo.11-12 and in the Donald Ross Collection, PAM, MG1 D20 M310.

> The death of Sir George Simpson will not interfere in the least with your operations as respects this District - within its bounds my authority is paramount, except special orders of Council be sent me on any subject which I am bound to obey.[390]

But the Company had denied him the rank commensurate with such power, and he therefore plunged into what would become almost frenzied scientific activity in an effort to garner the fame and the respect that had escaped him through the trade. By July 1861 he had already expressed his hopes to Baird: "I wish to make myself a name in the scientific world if possible, and I am sure that you will do all in your power to gain it for me."[391]

Ross had established contact with the Smithsonian some time before Kennicott's arrival, probably through his acquaintance with George Gibbs.[392] Gibbs had lived in the Washington Territories for twelve years and he had also been a member of the North West Boundary Survey in 1857, but Ross only became totally absorbed by collecting after meeting Kennicott in 1859. He was most anxious to assist Kennicott's expedition and he promised the young naturalist that he would send " ...necessary baggage any where in the district from Slave Lake to the Yukon by the regular brigades free gratis for nothing and that if I chose it shall cost me

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390 Letter from Ross to Baird, 18 March 1861, SIA, HBC Corr Coll, Folder 36.

391 Letter from Ross to Baird, 10 July 1861, SIA, HBC Corr Coll, Folder 36.

392 Ross mentions his acquaintance with Gibbs in a letter to Henry, 28 Nov. 1858, SIA, HBC Corr Coll, Folder 36.

nothing but what I pay for clothes while I stay in his district!!"[393]

Ross' offer of free lodgings was not so generous as it appeared since the Northern Council had actually sanctioned the provision of free room and board for the American naturalist while visiting their northern posts.[394] But Ross did, nonetheless, expedite the Smithsonian program. He assisted Kennicott surreptitiously by using one of the prerogatives of his position as an officer. Ross suggested that the Smithsonian circumvent HBC policy by filling requisitions in his name. Free freight was one of the privileges of his position and by sending supplies addressed to the HBC officer-in-charge, the Smithsonian could avoid paying freight costs.[395] The extension of this privilege to Smithsonian goods did, however, exceed Ross' authority with regards to the use of HBC facilities and funds, and his actions eventually had financial repercussions:

> ... Barney has done incalculable damage by his dishonest dealings in "K" it was brot home to him of having misappropriated much of the companys property in obtaining his collections, and has been fined heavily by minutes of council this year; the result is, that people on this side feel an atipathy [sic] to meddling with collections of

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[393] Ibid. In another letter to Baird Kennicott remarked that by assuming the cost of his provisions, equal to that of a clerk's allowance of £ 25, the HBC saved him his greatest expense, 17 Nov. 1859, SIA, RU 7215, Box 13.

[394] Minutes of Council, Northern Department, Resolution 76, 1859-60; Resolution 78, 1860-61, and Resolution 84, 1861-62, H.B.C.A., PAM, B.239/k/13.

[395] This arrangement is discussed in a letter from Kennicott to Baird, 17 Nov. 1859, SIA, RU 7215, Box 13.

any sort.[396]

Ross' private account was debited £ 27.6.3 by Resolution 77, for misappropriation of HBC property while in charge of the Mackenzie River District.[397]

Kennicott knew that Ross had over extended his authority with regards to free freight before the second shipment of specimens had left the District in the spring of 1860. He therefore wrote Baird and asked him to petition Simpson on the Smithsonian's behalf.[398] The Smithsonian paid the freight on specimens and supplies carried between Washington and Portage La Loche,[399] but it appears that the HBC never actually consented to free freight for specimens travelling beyond La Loche. The issue was eventually resolved by individual collectors assuming transportation costs on their private accounts,[400] but until that time Kennicott complied knowingly and willingly with Ross' transgression.[401]

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[396] Letter from Laurence Clarke to Kennicott, 16 Jan. 1865, SIA, HBC Corr Coll, Box 1.

[397] Minutes of Council, 1865. H.B.C.A., PAM, B.239/k/3, p.302.

[398] Letter from Kennicott to Baird, 29 June 1860, SIA, RU 7215, Box 13.

[399] "Smithsonian Institution, In Account with the Honble Hudson's Bay Comp" 1863, 1864, 1865 and 1866, SIA, RU 7215, Folder 33.

[400] See letter from MacFarlane to Baird, 9 Sept. 1864, SIA, RU 7215, Box 14.

[401] The HBC also instituted a specific policy regarding the payment of board and lodgings by visitors following Kennicott's visit. Minutes of Council, H.B.C.A., PAM, B.239/k/24.

By the time Kennicott had reached Methy Portage he had devised a tentative agenda for his Arctic expedition. He was obsessed with the details of his travel plans, and henceforth repeated them unemittingly in his correspondence with Baird.[402] He was determined to go to the Yukon and he proposed a variety of strategies towards that end. After consulting Ross about his plans he settled on an itinerary in which he would remain in the vicinity of Fort Simpson at least until March of 1860, before travelling to Fort Good Hope on the Mackenzie River. He would then go up the Peel River, across the Rocky Mountains over to La Pierre's House, down the Porcupine River, and on to Fort Yukon by the winter of 1860-61. He planned to remain at Fort Yukon until July or August of 1861 and then return to La Pierre's House, staying there until early spring of 1861. He then planned to catch a ride with the HBC boats back to Fort Simpson, arriving in time to depart with the summer brigades and return home to the United States for the summer of 1862.[403]

Kennicott arrived at Fort Simpson in mid-August, well after the breeding season had passed. He had therefore missed his chance to collect eggs, but he had ample

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[402] See correspondence from Kennicott to Baird, SIA, RU 7215, Box 13.

[403] Kennicott adhered to these plans remarkably well, although excursions to Forts Resolution, Rae and Big Island during the summer of 1860 shortened his first visit to Forts Good Hope and LaPierre's House from the intended six months to less than two months. SIAR, 1862, p.40. and letter from Kennicott to Baird, SIA, RU 7215 and 7002.

opportunity to collect zoological specimens while settling into the routine at the northern posts. Kennicott soon discovered that he had set foot in Fort Simpson at one of the busiest times of year. He had arrived with the summer brigades, which carried north the next year's supply of trade goods and provisions and returned south with the fur returns from the previous season. Sorting and labelling, packing and unpacking, restocking the store, auditing both inventory and accounts, and preparing outgoing correspondence preoccupied the entire fort. By mid-November, Kennicott had had an opportunity to observe the daily routine at Fort Simpson and adjust accordingly. He soon described to Baird the details of his new life in the "laziest community I ever knew:"

> We breakfast (now) at 8 or 9 o.c. and have dinner at 4. Card playing, until we began writing for the packet, has been the regular employment in the evening. Though hereafter I mean to insist on being permitted to write at least part of the time.
>
> The officers duty is almost nothing beyond his actual presence. A little less than two months in the year is sufficient for all the writing. no wonder then they become lazy - Mr Ross and Brother Tadger [William Kirkby] are the only industrious men I've seen here.[404]

Kennicott often chastised himself for being indecently inactive, but his itinerary was hectic by comparison with his northern acquaintances. He invested as much time convincing and cajoling HBC employees to collect on behalf

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[404] Letter from Kennicott to Baird, 17 Nov. 1859, SIA, RU 7215, Box 13.

of the Smithsonian, as he invested in the collecting process itself. Almost all of the 'officers' of the district became intrigued by Kennicott's activities and many made some attempt to collect specimens. Most HBC traders took a less active role in collecting than Ross, but there was a general, if limited, enthusiasm for Kennicott's project. For example, at Fort Simpson J.S. Onion, Clerk, Thomas Swanston, Apprentice Clerk, Andrew Flett, Postmaster, and the Reverend W.W. Kirkby, Church Missionary Society, collected specimens for the Smithsonian Institution. Moreover, Onion had already assisted Kennicott while collecting en route between Norway House and Methy Portage.[405]

The collections coming from this motley group were not, however, distinguished quantitatively. These men were undoubtedly convinced that collecting specimens might allow them to escape the tedium associated with life at Fort Simpson, and Kennicott had some success at convincing Swanston, Flett and Onion that collecting should be substituted for cards. Recreational imperatives were, however, inadequate to justify prolonged enthusiasm for Kennicott's project. Nor did any of these men participate long enough to have developed a sense of the importance of their activities to science. The Fort Simpson contingent, excluding Ross, sent only small collections and their participation was sporadic and unsustained. None of the

[405] Letter from Kennicott to Baird, 18 June 1859, SIA, RU 7215, Box 13.

Fort Simpson men contributed as much as one percent of the total collections leaving the district. Nor did their contributions differ appreciably from any other. They simply sent the Smithsonian small numbers of specimens along with all the other HBC specimens.[406] They had no personal stake in the collecting enterprise, and the Reverend William West Kirkby had other obligations of obvious importance.

Kirkby (1828-1907), like Onion, accompanied Kennicott on his journey north with the Portage La Loche Brigade. The Anglican clergyman was travelling north as part of the Church Missionary Society's attempts to extend Christianity to northern indigenous peoples, and his wife Eleanor and their two small children accompanied him to his new mission at Fort Simpson.[407] Kirkby's first North American posting with the C.M.S. had been to St. Andrew's parish in Red River, and he became an ordained deacon in 1854, just two years after his arrival. He became a priest in 1856 and acquired his own mission in the Mackenzie River District three years later. His trip north in 1859 was the beginning of a ten year sojourn in the sub-arctic terminated by furlough, which was spent in England. In 1869 he was reassigned to the Anglican Mission at York Factory, where he stayed until 1879. He then emigrated to the United States

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406 No special mention was made about their collections in the SIAR.

407 Thomas C.B. Boon, "William West Kirkby, First Anglican Missionary to the Loucheux," The Beaver, Spring 1965, pp. 36-43.

and died in the Parish of Rye, New York State, while still serving the Church.

Julian Stewart Onion (1839-1907) made his way to Fort Simpson following a posting with the Royal Canadian Rifles at Red River.[408] The young officer had been born in Ceylon, but was of English descent, and his career in the army was assured by his training at Woolwich. Army life was apparently less lucrative than the £ 75 that he was offered for a clerkship with the HBC, and Onion joined the company immediately after selling his lieutenant's commission, and obtaining a release from the rifle corps.[409]

Onion's northern career with the HBC lasted forty-three years. He eventually became a Chief Factor of the company, and a Justice of the Peace on behalf of the Canadian government.[410] Onion served as a clerk at Fort Simpson for two years, before moving on to Fort Good Hope where he was placed in charge.[411] In 1863 he moved back to Fort Simpson and served under Chief Factor Hardisty until 1866 when he

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[408] Biographical information on Onion from Charles Camsell, Son of the North (Toronto: The Ryerson Press, 1954), pp.2-4.

[409] Information on Onion's salary can be found in the Minutes of Council, Northern Department, Resolution 74, 1862, H.B.C.A., PAM, B.239/k/13.

[410] Alexander Morris Papers, PAM, MG12 B1 #1934. See also, "List of Chief Factors who held Commissions during the Period, 1880-1924," Search File: Commissioned Officers, H.B.C.A., PAM.

[411] See Appendix 3 for details of Onion's postings between 1859 and 1871.

moved on to Thickney Post. He then went to Nelson River and, while there, married Sarah Foulds.[412] In 1876 Onion travelled to London to change his surname from that of his father's family, to that of his mother's. He was thereafter named Camsell. In 1882 he was stationed in Fort Simpson and placed in charge of the District. He was made Chief Factor in 1884.[413] He retired from the service in 1903, just four years before his death.

Onion's career with the HBC began at the same time that he made Kennicott's acquaintance, and he was not only busy learning the requirements of his new position, he perceived that position as preferable to his previous employment in the military. Onion was just embarking on a new career and he undoubtedly had great hopes for his future with the company. He had no grievance with the company, nor did he share any of the antipathy harboured by some of the more seasoned employees.

Onion and Kirkby had been subjected to Kennicott's persuasive powers on their trip north from Norway House, but Flett and Swanston met Kennicott after he was settled at Fort Simpson. Kennicott again had only limited success in

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[412] Sarah was the daughter of a Yorkshire man - Samuel Foulds, and Samuel's wife, Ann Caulder, was the daughter of an Orkneyman. Sarah was in all liklihood of mixed ancestory since her grandson, Charles Camsell, carefully avoided tracing the maternal geneaology of Sarah's mother Ann.

[413] J.L. Gaudet, "Chief Trader Charles Philip Gaudet," The Beaver, Sept. 1935, p.45.

his attempts to make collectors out of Flett and Swanston. Swanston was the Postmaster at Fort Simpson when Kennicott arrived there in 1859, but he was soon promoted to Apprentice Clerk, with Andrew Flett replacing him as Postmaster.[414] Very little is known about either man, but the fact that they never corresponded with Baird, nor he with them, reflects slight interest in participating.[415]

Both Swanston and Flett came from the servant class, although Flett did eventually work his way into a clerkship after having served as a Postmaster, assistant trader, fisherman, bowsman and "midman."[416] But these men would have had considerably fewer opportunities to undertake serious collecting. Flett and Swanston belonged to the upper echelon of the working classes, which spent many more hours actually working, than did the "gentlemen" or "bourgeois." Collecting may have simply seemed like additional labour to men who were already responsible for the back-breaking, boring and menial tasks at the post. The servant class was

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[414] Information on the career progression of Swanston and Flett can be found in: Resolution 13, Minutes of Council, 1858, H.B.C.A., PAM, B.239/k/13. Resolution 12, Minutes of Council, 1859, H.B.C.A., PAM, B.239/k/13. Resolution 12, Minutes of Council, 1860, H.B.C.A., PAM, B.239/k/13. Swanston left the District until 1867 when he returned as Apprentice Clerk at Fort Resolution and, in 1869, he was promoted to Clerk with his posting to Rapids. See: H.B.C.A., PAM, B.239/k/13.

[415] Correspondence Registers, Assistant Secretary and Secretary, 1855-68, SIA, RU 57, Boxes 2 and 3.

[416] H.B.C.A., PAM, B.239/g/86-99; B.239/k/3, p.202, 221, 242, 264, 286, 309, 330, 351, 375, 406, 431; B.239/k/4, fo. 1d, 10d, 20, 30d, 48, 54d; and B.239/u/4, no.87.

responsible for transporting furs, provisions and trade goods between posts and Indian camps. They were charged with the duties of keeping the ice house filled, packing furs, tending crops, and securing wood for fuel and lumber. They made snow shoes, built sledges and, above all, tended the fishing nets which were vital to the sustenance of the posts.[417] Collecting was unnecesary to fill a void that seldom existed in their workday.

Moreover, Flett had an unusual degree of success with the company. He had originally come from the parish of Orphir, joining the Company in 1846 as a labourer.[418] He retired from the Company after thirty-six years of active service, and having risen to the rank of clerk he fared better than many of his Orkney and mixed blood counterparts. Injustices there undoubtedly were, but career advancement and status were seldom at issue amongst the labourers in the same way that they were amongst the middle classes.

Collecting in the northern and western regions of the District was coordinated out of Forts aux Liards, Halkett, Norman, Yukon, Peel's River, Good Hope, Anderson and LaPierre's House and an analogous network emerged. Kennicott found both dabblers and enthusiasts. Kennicott met W.L. Hardisty at Fort Resolution, Laurence Clarke at Fort Rae, and John Reid at Big Island during the summer of 1860.

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[417] Isaac Cowie, The Company of Adventurers (Toronto: William Briggs, 1913), pp.272-78.

[418] H.B.C.A., PAM, B.239/u/1, fo.122.

Kennicott subsequently met Alexander Mackenzie, James Dunlop, Nicol Taylor, James Lockhart, Charles Gaudet, James Flett and Roderick Ross MacFarlane when he visited the posts in the northern and western parts of the District. In every case, recreational collecting was short-lived at best and delusory in fact. Collecting and processing specimens was simply too onerous to hold much attraction to those employees already engaged in physical labour at the posts.

William Lucas Hardisty (c.1822-1881), the son of Chief Trader Richard Hardisty, was in charge at Fort Resolution when Kennicott visited. He began his career with the HBC in the Mackenzie River District in 1842, and as was often the case with second generation fur trade families, he entered the service with a noncommissioned posting.[419] His ascent through the ranks was, however, comparable to his European counterparts. He advanced through the ranks with relative rapidity, especially in view of his native ancestry. He went to Fort Yukon in 1851 as a clerk, rather than as a postmaster and, by 1858, he had been promoted to the rank of Chief Trader. Following his promotion he was stationed at Fort Resolution. He stayed at Resolution one season before moving on to Fort Liard, where he remained until 1862. He then left this minor post for Fort Simpson, where he assumed responsibility for the Mackenzie River District until his

[419] See Jennifer Brown, "William Lucas Hardisty," in Dictionary of Canadian Biography, vol.11, pp.384-85, and Carol M. Judd, "Employment Opportunities for Mixed Bloods in the Hudson's Bay Company to 1870," H.B.C.A., PAM, pp.1979-21.

retirement in 1878.

Many of Hardisty's last seventeen years with the Company were spent at Fort Simpson, during which time he devoted himself to his trading and administrative duties. Hardisty never really took to collecting in the way that his predecessor Ross had done, although his observations on northern natives were similarly published in the Smithsonian Annual Report, (1866). Hardisty had submitted specimens in five out of the nine collecting periods covering the thirteen years between 1859 and 1871, but his contribution formed less than one percent of the total number of specimens that had been submitted by the Mackenzie River collectors.[420]

Hardisty only dabbled at collecting for the Smithsonian, as did his wife Mary Allen. In 1860 Mrs. Hardisty sent some mammals and eggs from the Great Slave Lake region to Baird, but neither she nor her husband collected to any extent.[421] Hardisty did, however, recognize that many of his employees enjoyed collecting. He not only sanctioned these activities, but integrated them within his management practices: " ... it is said that Mr WL Hardisty when he wishes to smooth over an 'obstropolus' [sic] member of staff promises that he will send him on an expedition, on which the recusant will have an opportunity of collecting 'nice things' for the

[420] See Table 5.2.

[421] SIAR, 1860, p.80.

Smithsonian ..."[422]

Hardisty had perhaps achieved a measure of success beyond any that he could have expected. Comparatively few mixed bloods could boast of similar successes since 1821 and it is unlikely that Hardisty expected to out-rank his father. He was therefore in a quite different situation from Ross. Hardisty derived a measure of satisfaction from the resolution of operational requirements that Ross denied himself. Ross was overqualified, or at least he felt that he was overqualified for the position that he had attained, and was therefore very dissatisfied with his lot in life. In 1867 Hardisty apologized to Baird for his dismal participation in the Smithsonian's project, but he had more pressing problems at that time:

> For myself I confess that I feel rather humiliated and ashamed of the very inadequate return that I have been able to make in furtherance of your wishes in regard to collections for the Smithsonian Institution.- but the fact is my dear Sir, I have fallen on troublesome times.- opposition to our trade, and the consequent discontent and unsettled state of the Indians arising therefrom, has greatly increased the labours and diffeculties [sic] of my position here - and keep me fully employed, especially during the summer months - The only assistance that I have been able to render was in buying the goodwill and careful treatment of the Red River tripmen for MacFarlanes cases of collections usually forwarded from Portage La Loche, ...[423]

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[422] Letter from William Mactavish to Baird, 29 Jan. 1866, SIA, HBC Corr Coll, Folder 33.

[423] Letter from Hardisty to Baird, 24 Nov. 1867, SIA, HBC Corr Coll, Folder 22.

Hardisty did what he could for the Smithsonian, but his allegiance and his interests rested chiefly with the Company.

Another very minor collector was Laurence Clarke Junior (1832-1890). He was in charge of Fort Rae when Kennicott first visited that post, and he remained in charge there until he left the district in 1863.[424] Clarke was posted immediately to the Mackenzie River District when he joined the company as a clerk in 1851, arriving at this northerly posting after having spent some years living in the West Indian tropics.

Clarke was of Irish descent, born in Fermoy, Ireland. He rose through the HBC hierarchy with rapidity, especially after his transfer to the Saskatchewan District in 1863. He was made a Chief Trader on 12 April 1867, a Factor on 9 April 1872, and a Chief Factor on 1 June 1875.[425] Clarke not only advanced through the company, but obtained prominence in the community after he left the Mackenzie River District. His previous interests in natural history and ethnography, which had been only sporadic and short-lived at any rate, were replaced by an interest in the politics, economics and social life of the northwest. He settled in Prince Albert in

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[424] Stanley Gordon, "Lawrence Clarke," in Dictionary of Canadian Biography, vol.11, pp.194-95, and PAM, H.B.C.A., B.239/k/13.

[425] "List of Chief Factors who held Commissions during the Period, 1880-1924," Search File: Commissioned Officers, H.B.C.A., PAM.

1878, and he was instrumental in the establishment of Emmanuel College and in the extension of telegraphic and rail services to the Prince Albert area following his relocation there. In 1881 he was elected to the Council of the North West Territories, representing the District of Lorne, and he was also responsible for the establishment of a land titles office in Prince Albert.[426] He was also elected to the Prince Albert Board of Trade, and was President of the executive between 1887 and 1889.

Clarke's schedule was undoubtedly full, but even before 1870 he had written apologetically to Baird on several occasions regarding his inability to continue collecting. He protested that it was time, rather than inclination, which prevented him from collecting while stationed at Fort Carlton. The hectic pace associated with the routine at the plains distribution centre apparently prevented him from collecting there in 1867.[427] Clarke's preoccupation with encroachments made by rival traders also diverted his attention from collecting when he was first stationed at Fort a la Corne (1863-66) in the Saskatchewan District. Moreover, Clarke faced an impediment unappreciated in the north. The Saskatchewan Indians would seldom collect natural history specimens since they were, Clarke wrote,

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[426] The land titles office was, according to Gordon, established in Prince Albert because Clarke drafted a resolution requesting Council to extinguish Metis land claims. p.195.

[427] Letter from Clarke to Baird, 1 Oct. 1867, SIA, HBC Corr Coll, Folder 9.

either at war amongst themselves or suffering the consequences of measles and influenza epidemics.[428]

Clarke was insufficiently motivated. He had no need of science. He had gained power and responsibility without it. He experienced a fleeting guiltiness over not having done more for "science," but he collected very little for the Smithsonian. Clarke only managed to submit one meteorological register after leaving the north and, in fact, the records for November and December, 1864, were not compiled by Clarke himself. His wife Jane had assumed responsibility for the records, just as she had done previously at Fort Rae.[429]

John Reid (c.1826-1895) was Postmaster in charge of the smallest post in the eastern half of the District, when Kennicott met him, and Reid's collecting activities were almost solely attributable to Kennicott's influence. Virtually all of his contributions were submitted when Kennicott visited him at the eastern fishing station in 1860.[430]

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[428] Letter from Clarke to Baird, 21 Jan. 1866, SIA, HBC Corr Coll, Folder 9

[429] Letters from Clarke to Baird, 16 Jan. 1865 and 1 Dec. 1861, SIA, HBC Corr Coll, Folder 9, refer to the participation of his wife Jane in the Smithsonian Programs. Jane was the daughter of Chief Trader John Bell.

[430] Information on the role of Big Island in the District's economy is from a letter written by Kennicott to Baird, 4 April 1860, SIA, RU 7215, Box 13.

Reid came from Eday Parish, Scotland before entering the service as a labourer with the Northern Department.[431] He served as a midman, steersman, fisherman and interpreter before being promoted to the position of Postmaster in 1857.[432] He was, according to Kennicott's description: "... a postmaster raised from a common man and uneducated but very conceited - tho obliging and not a bad fellow at all -"[433] He was Postmaster in charge for twelve of the fifteen years that he spent at Big Island, but he was only given a clerkship in 1877.[434] In 1885 he was promoted to the rank of Junior Chief Trader, and this was the highest position that he obtained during his career with the company.[435] If he had aspirations similar to those of the more prodigious contributors, he had neither the education not the acumen to realize those dreams. His efforts were, for example, used by Ross and others to augment their collections.[436]

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[431] See H.B.C.A. biographical files for information on Reid, and see Minutes of Council, Northern Department for details of his postings. H.B.C.A., PAM, B.239/g/83.

[432] H.B.C.A., PAM, B.239/g/88-100; D.38/26, fo.28; B.239/k/3, pp.163, 183, 202.

[433] Letter from Kennicott to Baird, 29 June 1860, SIA, RU 7215, Box 13.

[434] H.B.C.A., PAM, D.38/26, fo.8,12,14.

[435] H.B.C.A., PAM, D.38/26, fo.18,22d,23,24.

[436] Reid complained of advantages taken by both Ross and Clarke. He even stated that many of his contributions had gone unrecognized because Ross had sent them under his name. Letters from Reid to Baird, 8 Dec. 1863, and Reid to Kennicott, 6 Dec. 1864, SIA, HBC Corr Coll, Folder 35.

The Smithsonian also received natural history specimens and anthropological artifacts from traders stationed in the northern and western regions of the Mackenzie River District. Alexander Mackenzie, James Veith Dunlop, James Flett, Nicol Taylor, William Brass, James McDougall, James Lockhart, Charles P. Gaudet, Strachan Jones, and Roderick Ross MacFarlane sent specimens south between 1860 and 1871. Mackenzie, Dunlop, Taylor and Flett were generally only marginal participants in the collecting process, and of this group only Flett actually corresponded with the Smithsonian. There is no extant correspondence from Mackenzie, Taylor or Dunlop to Baird, and the Assistant Secretary wrote individual letters to Taylor and Dunlop on one occasion only, and to Mackenzie only twice.[437] Marginal collectors often straddled the divide between the "gentlemen" and "servant" class, and such was certainly the case with this group in 1860.

Very little is known about the man who sent some of the first HBC collections south. Alexander Mackenzie served as a clerk in various posts throughout the District until he retired from the service in 1868.[438] He was one of the first HBC men to embrace collecting, but his contributions were small and sporadic. Collections were received in his name on

[437] Baird wrote Taylor and Dunlop on 12 April 1861, and he wrote to Mackenzie on 9 Oct. 1860 and on 9 Oct. 1866. Correspondence Registers, Assistant Secretary and Secretary, SIA, RU 57, Box 2.

[438] Resolution 74, Minutes of Council, Northern Department, H.B.C.A., PAM, B.239/k/13.

only two occasions, and his collections accounted for slightly more than one percent of the total number sent south from the District.

Nicol Taylor (b.c. 1817) sent an almost immeasurable percentage of the HBC collection sent south. He was probably one of the less well educated collectors, serving as a middleman, labourer and fisherman until 1849 when he was promoted to interpreter.[439] In 1855, fully twenty years after joining the company, Taylor was promoted to the noncommissioned rank of Postmaster.[440] In 1863, Taylor was finally made clerk in charge of Fort Norman, and he served as a clerk in the Mackenzie River District until 1879.[441]

James Flett (c.1825-1899), like Taylor, signed on with the HBC in Scotland.[442] Flett came from Rousay parish in the Orkney Islands and he entered the service as a labourer in 1845.[443] He was a labourer, fisherman, bowsman, guide and interpreter until 1861, when he was promoted to Postmaster in charge of LaPierre's House.[444] He served as Postmaster in

[439] H.B.C.A., PAM, B.239/g/75-94.

[440] H.B.C.A., PAM, B.239/g/95-96.

[441] H.B.C.A., PAM, B.239/k/1, fo.1d,10d,20; B.239/k/3, p.264,286,308,330, 351,375,405,431; B.235/k/1, fo.20d,48d.

[442] Taylor came from Orphir and entered the service in 1835. H.B.C.A. Biographical files.

[443] See H.B.C.A. Biographical files and B.239/g/85; B.239/u/1.

[444] H.B.C.A., PAM, B.239/g/86-107; B.239/u/1-2; A.32/28, fo.243,245,253; D.38/66, fo.64.

the Mackenzie River District until 1875 when he was made a clerk, and he remained a clerk until his retirement in 1891.[445]

James Dunlop came from the parish of Wandsworth, joined the company as an apprentice Clerk in 1856, and served his apprenticeship in the Mackenzie River District.[446] He was promoted to the rank of clerk for the 1861-62 outfit, and he retained that position until he retired from the service in 1867.[447] Dunlop, like Onion, had been employed with the HBC only briefly at the time of Kennicott's arrival, and had not developed any deep sense of grievance against the Company. He was undoubtedly convinced to collect specimens by Kennicott, although the American's arguments may have been reinforced through Dunlop's desire to impress his prospective father-in-law. Unfortunately, the half dozen specimens Dunlop sent the Smithsonian in 1860 provided scant evidence of his intellectual prowess. Dunlop's efforts in the pursuit of knowledge were apparently less significant than his other attributes and he married Jane, the eldest daughter of Chief Factor George Barnston in 1863. By 1872,

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[445] H.B.C.A., PAM, B.114/d/2, fo.7d; B.239/g/101-113; B.239/k/3, pp.221, 243,264,287,309,330,351,375,376,405,406,431,432; B.235/g/1-11; D.38/6b, fo.64; B.235/k/1, fo.1d,20,30d,48d,54d,80,91,100d; B.239/u/4-5; B.235/u/5; D.38/4, pp.42-43,58-59,70-71; D.38/5; D.38/49.

[446] H.B.C.A. Biographical file, and see H.B.C.A., PAM, B.239/k/3, p.142,163,182,202.

[447] H.B.C.A., PAM, B.239/k/3, pp.223,241,263,285,307,328; B.56/a/14; B.56/d/11-13; B.239/g/107.

they had five children and were living in Ceylon.[448]

Two of the men stationed at Fort Yukon made similarly small contributions to the Smithsonian collections. In 1860 William Brass began his two year tenure at Fort Yukon, and in 1863 James McDougall joined Strachan Jones, officer in charge at Yukon, as his assistant.[449]

Brass was originally from the parish of Sandwich in the Orkney Islands, and he entered the service in 1845 as a labourer.[450] Brass was promoted to the rank of Postmaster in 1859 after having served as middleman and interpreter, in addition to his first five years of service employed as a labourer.[451] He served under Lockhart and Jones for two years before moving on to forts Halkett, Nelson and Hay River. He was promoted to clerk in charge in 1860, and became a free agent in 1887.[452] In 1883 Brass moved to Manitoba intending to retire, but he returned north within the year after finding himself unable to adjust to life in the south.[453]

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[448] George A. Dunlop and C.P. Wilson, "George Barnston," The Beaver, Dec. 1941, p.17 and J.S.H. Brown, Strangers in Blood, pp.194-195.

[449] See Appendix 3.

[450] See H.B.C.A., Biographical file and B.239/g/85.

[451] H.B.C.A., PAM, B.239/g/86-98; B.200/f/1, fo.4d,5; B.239/k/3, p.183.

[452] H.B.C.A., PAM, B.239/k/3, p.202,221,242,264,286,308; B.200/f/2, fo. 2,8,12,14,19; B.239/g/112,113; D.24/3, p.57.

[453] H.B.C.A., PAM, D.24/5, fo.30.

James McDougall (1843-1904) joined the HBC in 1862. He was originally from St. Andrew's County, Fife, Scotland, and he began his journey west when he signed on the company's ship in Gravesend.[454] McDougall was posted to the Northern Department as an apprentice clerk when he arrived in Rupert's Land, and in the following year he was posted specifically to Fort Yukon.[455] By 1867 he had been promoted to clerk in charge at Fort Yukon, and in 1872 he was made a Junior Chief Trader.[456] In 1873 he was made a Chief Trader, in 1879 a Chief Factor, and in 1889 an inspecting Chief Factor.[457]

McDougall and Brass made small contributions to the Smithsonian natural history and ethnological collections and their participation in collecting activities was unsustained. However the limited nature of their participation in the collecting process characterized the level of participation that was exhibited by the vast majority of HBC collectors.

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454 James McDougall, "Young Apprentice," in two parts, The Beaver, June 1952, pp.8-11 and Sept. 1952, pp.10-12. See also H.B.C.A., PAM, A.32/40, fo.284.

455 H.B.C.A., PAM, B.239/g/102, fo.5; B.239/k/3, p.264,287; B.239/g/103,104.

456 H.B.C.A., PAM, B.239/k/3, p.351,376; B.239/g/108,109,113.

457 H.B.C.A., PAM, B.235/k/1, fo. 1d,56,69,81,91 B.235/g/1,2,5-7,10,11; D.14/12, fo.574; D.33/1, fo.2,45; D.14/4, fo.121,340.

Charles Philip Gaudet (1827-1917) had reportedly been a "wild boy" in Canada and had consequently entered the fur trade with only a rudimentary education.[458] But he had some aptitude for science even though his abilities were restricted by primitive communicative skills. His correspondence with Baird attests to his inadequacies. His penmanship was poor and his grammar, syntax and spelling childlike. The evidence supplied by these letters contradicts that provided by the invoices that accompanied his specimens to the Smithsonian. These lists identified his zoological specimens with scientific nomenclature, as well as describing the conditions under which his specimens were obtained.[459] But since they are so incongruent with his correspondence, he must have had some assistance in their composition. Gaudet had some familial ties to science, and perhaps those ties provide a clue as to why he would extend himself well beyond his educational capabilities. His brother, J.F. Gaudet [also referred to as Fred J.] was a surveyor, and he had accompanied the Hind Expedition to the Labrador Pennisula in 1861.[460]

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[458] Information on Gaudet's youth from a letter Kennicott wrote Baird, 21 Jan. 1862, SIA, RU 7215, Box 13.

[459] See Appendix 3 for extracts from Gaudet's specimen lists.

[460] H.Y. Hind, Explorations in the Interior of the Labrador Pennisula: The Country of the Montagnais and Nasquapee Indians, vol.2 (London: Longman, Green, Longman, Roberts and Green, 1863), p.3.

Gaudet was born and raised in Montreal, entering the service in 1852.[461] Gaudet was initially posted to Fort Resolution, but he was sent to Fort Yukon in 1854 where he stayed two years before being posted to Fort McPherson or the Peel River Post. In 1859 he married a native woman while stationed at Peel's River, and they subsequently had one daughter and four sons. Gaudet remained at Peel's River until the 1863-64 outfit when he was reassigned to Fort Good Hope.[462] He stayed at Good Hope until 1866, and he became a clerk in 1863 while in charge. Gaudet was eventually made a Chief Trader and remained with the company until 1911.

Gaudet's collection, while undeniably important, was numerically insubstantial (1.5%). The sum total of his collection may have been more significant that indicated by this percentage in view of Kennicott's report that Gaudet gave many of his earlier specimens to Ross.[463] But Gaudet

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[461] Information on Gaudet has been derived from the H.B.C.A. Search File: "Misc. G Folder People," from an article written by one of Gaudet's descendants, J.L. Gaudet. "Chief Trader Charles Philip Gaudet," The Beaver, Sept. 1935, pp. 45. and from a letter written by J.L. Gaudet to R.R. MacFarlane 3 April 1918. MacFarlane forwarded Gaudet's letter to Edward Alexander Preble, who was compiling biographical data on the HBC collectors, at the Smithsonian. Edward Alexander Preble Papers, 1887-1957, SIA, RU 7252, Box 3, Folder 13. There is some discrepancy between these sources and the HBC Minutes of Council regarding the year Gaudet joined on with the company. He is registered as a a postmaster in 1851, at the lowest rate of pay of £ 25. Resolution 68, H.B.C.A., PAM, B.239/k/12, p.322.

[462] See Appendix 4.

[463] Letter from Kennicott to Baird, 21 Jan. 1862, SIA, RU 7215, Box 13.

was genuinely indifferent to receiving credit for his scientific activities. He seems to have collected mainly out of respect for Kennicott.

Gaudet's estimation of Kennicott was shared by his colleague, James Lockhart. Lockhart was in charge of the Fort Yukon trade when Kennicott wintered there in 1861, and the two bachelors became friends and confidants. Lockhart and Kennicott both preferred the company of dogs to that of people. But neither trader nor naturalist were especially critical of their fellow man. Both were, however, severely critical of slavery. One of Lockhart's few outbursts against humanity was provoked by his antipathy to the armed conflict brought on by the southern states or, as he called them, the "nigger drivers." Kennicott similarly deplored the deleterious effects of slavery on the peace of his country,[464] but neither Kennicott nor Lockhart was particularly aggressive in their condemnation. Kennicott did contemplate joining the Union army upon his return, but he was torn between his duty to country and his duty to science.[465] Both Kennicott and Lockhart were disinclined towards violence, and Lockhart's hope that north and south would "kiss and make up" exemplifies his conciliatory disposition. But he also added somewhat less charitably that Jefferson Davis deserved to be "made a slave of, in his

[464] Letter from Kennicott to Baird, 25 Oct. 1862, SIA, RU 7215, Box 13.

[465] Letter from Kennicott to Baird, 18 Oct. 1863, SIA, RU 7215 Box 13.

turn."[466]

Both Lockhart and Kennicott were confirmed bachelors although, while in a pessimistic mood, Lockhart once intimated that he might chance matrimony rather than return to a life of "exile and banishment" in the north where " ... the Siberian exiles are much better off in many respects than we are in the company's service -"[467] However, Lockhart had less cause for complaint about his position with the Company than many of his colleagues. He had been a resident of Lachine, the HBC's overseas headquarters, when he joined the service in 1849. He was promoted to the rank of Chief Trader within twelve years of signing on with the Company, although he never advanced any further before retiring to Whitby, Ontario, in 1873.[468] He was only twenty-two years old when he received his first posting as an apprentice clerk to the Lower Red River District.[469] In 1854 he was promoted to the position of clerk and during that year he was dispatched to one of the Exploratory and Search Expeditions to the Arctic.[470] The following year he was transferred to the Mackenzie River District, placed in

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[466] Letters from Lockhart to Baird, 21 Nov. 1864 and 28 Nov. 1864, SIA, HBC Corr Coll, Folder 26.

[467] Letter from Lockhart to Baird, 5 Feb. 1867, SIA, HBC Corr Coll, Folder 26.

[468] H.B.C.A., PAM, B.135/b/55, fo.96.

[469] Letter from Simpson to Hargrave, 28 June 1849, H.B.C.A., PAM, B.239/c/5.

[470] H.B.C.A., PAM, E.15/11.

charge of Fort Yukon in 1860, and one year later promoted to Chief Trader.[471] He remained at Yukon until 1863 when he was put in charge of Fort Resolution, and he stayed there until he received furlough for the 1866-67 outfit.[472] He was relocated to Abitibi following his year's furlough, and that posting suited the pacific Lockhart.[473] Even before leaving the north, he had been anxious to move to a less taxing location. He disliked confrontation, and by 1865 the "Yankees" had already made inroads on the HBC trade along the Rocky Mountains.[474]

Lockhart travelled to the Canadian provinces and spent his furlough visiting his brother, sister and their families.[475] He also went south to New York City where he met with the Secretary of the Western Union Telegraph Company, before going on to see Baird in Washington.[476] The WUTC needed geographical and climatological information

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[471] See Appendix 3 for details of his commisssions and postings.

[472] See correspondence from Lockhart to Baird for details of the traders whereabouts while on furlough. He spent most of the year visiting his sister's family in Montreal, and visiting his brother's family in Whitby, Canada West. SIA, HBC Corr Coll, Folder 26.

[473] Letter from Lockhart to Baird, 9 April 1867, SIA, HBC Corr Coll, Folder 26.

[474] Letter from Lockhart to Kennicott, 26 June 1865, SIA, HBC Corr Coll, Folder 26.

[475] Letter from Lockhart to Baird, 19 Nov 1866, SIA, HBC Corr Coll, Folder 26.

[476] Letter from Lockhart to Baird, 5 Feb 1867, SIA, HBC Corr Coll, Folder 26 and Telegram from Lockhart to Baird, 19 Feb. 1867, SIA, HBC Corr Coll, Folder 26.

prior to laying cable overland to Europe via Bering Strait, and Lockhart could provide accurate and inaccessible knowledge about the HBC territories. Lockhart was sufficiently chagrined by his relationship with the HBC that he not only agreed to part with privileged information on the Yukon, he offered similar services on behalf of his former assistant, Strachan Jones.

Jones was also on leave in Canada West during 1867.[477] Jones spent most of his furlough visiting friends and family at Goderich on Lake Huron, but he too made a trip to New York and Washington.[478] Both Jones and Lockhart had been tentatively offered positions with the Overland Telegraph but Baird advised them to return to their former positions with the HBC.[479] Jones received this most unwelcome news just before his leave ended. He was undoubtedly convinced that his education and social background entitled him to more than a clerkship with the HBC. Jones was the son of Thomas Mercer Jones, one time chief officer of the Canada Company in the colonies, and Elizabeth Mary Strachan, daughter of Anglican Bishop John Strachan.[480] He was a

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[477] See Appendix 3 for list of the postings and commissions held by Jones, and see letters from Lockhart to Baird, 3 April 1867, SIA, HBC Corr Coll, Folder 26 and from Jones to Baird, 7 Nov. 1866, SIA, HBC Corr Coll, Folder 24, for details of his whereabouts and activities while on leave during 1867.

[478] Letter from Jones to Baird, 15 April 1867, SIA, HBC Corr Coll, Folder 24.

[479] Letter from Jones to Baird, 23 April 1867, SIA, HBC Corr Coll, Folder 24.

graduate of Toronto College and, according to Kennicott, a "gentleman by birth & education and a brick -- tho' what is called a dry stick."[481] Kennicott's assessment was probably pretty near the mark since Jones was heir to a social and economic conservatism characteristic of Family Compact members such as his father and grandfather. His unabashed assessment of the Fenian Brotherhood as "robbers and plunderers" also attests to his strong Anglo-Anglican roots.[482]

Lockhart and, to a much lesser extent, Jones were reponsible for coordinating the collecting activities out of Fort Yukon. Between them they made impressive contributions to the Smithsonian Museum (Lockhart, 9.5%; Jones, 5%). But their northern colleague Roderick Ross MacFarlane sent unprecedented numbers of natural history specimens. MacFarlane's fame as a collector was virtually unsurpassed. He was one of the most prodigious collectors in North America, and he was proud to bear the distinction of having donated the second largest individual collection to the Smithsonian during the nineteenth century.[483]

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[480] Roger D. Hall, "Thomas Mercer Jones," Dictionary of Canadian Biography, vol.9, pp.415-17. Letter from Jones to Baird, sent from Toronto and received at the Smithsonian on 9 April 1867, SIA, HBC Corr Coll, Folder 24. and see, W.W. Kirby [sic], "A Journey to the Youcan, Russian America," SIAR, 1864, p.417.

[481] Letter from Kennicott to Baird, 23 June 1861, SIA, RU 7215, Box 13.

[482] Letter from Jones to Baird, 15 April 1867, SIA, HBC Corr Coll, Folder 24.

MacFarlane's collecting activities were incessant and rumours of his preference for gathering specimens, at the expense of the company's business, had reached Governor Mactavish in 1865.[484] However Mactavish was a strong supporter of the Smithsonian programs, and his response to accusations regarding MacFarlane's unbusinesslike conduct reflected that commitment. Mactavish planned to punish MacFarlane's transgression by transferring him to Churchill which was, he believed, an untapped treasure trove of natural history specimens. The Scottish trader was never, despite Mactavish's intentions, posted to Churchill and the closest he ever came to a bayside posting was in 1871. He was then posted to Fort Chipewyan as factor in charge of the Athabasca District.[485]

MacFarlane (1833-1920) had signed on with the company in 1852, before leaving his home in Stornoway. He had family connections in the company, most notably his uncle Donald Ross who was a Chief Factor. His first posting as an apprentice clerk was at Pembina, but he was transferred to the Mackenzie River District in the following outfit.[486]

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483 "Retired Chief Factor R. MacFarlane," extracted from the third volume of Schofield's The Story of Manitoba, PAM, MG14 C23 Box 2 #47. This pamphlet differs, however, from the biography found in Schofield's volume. The pamphlet is significantly longer, and contains several highly subjective comments on the part of its author - MacFarlane himself.

484 Letter from Mactavish to Baird, 29 Jan. 1866, SIA, HBC Corr Coll, Folder 33.

485 H.B.C.A., PAM, B.239/k/1.

MacFarlane was made clerk in charge of Fort Rae, and this posting was the beginning of an extended stay in the north.[487] He subsequently spent twenty years in the Mackenzie River District, and sixteen years in the Athabasca District. He acquired considerable experience as an explorer and surveyor, as well as a trader, during these years. He explored the Beghula or Anderson River in 1857[488] and again in 1860, before establishing Fort Anderson in 1861.[489] MacFarlane also made four overland trips to the Arctic Ocean. These last expeditions were made in search of zoological specimens, and they prompted serious criticisms about his devotion to duty. MacFarlane, however, maintained that these expeditions were accomplished "... while the duties of the post were by no means neglected."[490] Moreover, according to MacFarlane's own account, the intimate knowledge of northern water routes obtained through his many expeditions, was instrumental in the eventual introduction of steam powered craft onto the Mackenzie River. MacFarlane had argued in favour of steam navigation for "several

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[486] H.B.C.A., PAM, A.10/82b, fos.187-197; and letters dated 11 Feb. 1904 and 7 Oct. 1907.

[487] H.B.C.A., PAM, B.239/k/3, p.48.

[488] This river was named the Begh-ulatesse on Arrowsmith's 1863 map. H.B.C.A., PAM, G.3/11.

[489] This fort was built to facilitate trade between the HBC and the northernmost Inuit. References to MacFarlane's exploring activities can be found in "Retired Chief Factor R. MacFarlane," extracted from the third volume of Schofield's, The Story of Manitoba, PAM, MG14 C23 Box 2 #47, p.5.

[490] Ibid.

years," and he proudly claimed responsibility for the success of the maiden voyage of the Grahame in 1882.[491]

MacFarlane's progression through the HBC hierarchy was no more expeditious than most of his colleagues. He served eighteen years before being promoted to Chief Trader in 1870, and a promotion to Factor came quickly.[492] He became a Factor in 1871, and it was in this year that he made his final donation to the Smithsonian. Baird had received only one specimen from MacFarlane in 1871, and he had received none from him the previous year.[493] Moreover, Baird received only two hundred and eighty specimens from MacFarlane between 1867 and 1869, a marked decline from the previous five years, in which he had sent some 4350 specimens.

His decreased productivity was at least partially due to the decimation of his corps of indigenous collectors. A scarlatina epidemic had killed 1,100 persons or more than twenty percent of the native population living near Fort Anderson in the winter of 1866, and in 1867 one-third or twenty of the Indian tripmen engaged by the Company succumbed to a "billious" fever.[494] MacFarlane's collections

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[491] Ibid.

[492] H.B.C.A., PAM, B.239/k/3, p.405,432; B.239/k/1, fo.1d,11,20d,31,47,55,68,80d,90d,100d; D.38/1, fo.42; D.19/8.

[493] Information on numbers and types of specimens sent by MacFarlane comes from three sources. The SIAR, the MacFarlane Papers, SIA, RU 7215, Box 14 and the Anthropological Registers, SIA, RU 6990T.

[494] "Retired Chief Factor R. MacFarlane," p.5.

were nevertheless respectable. His most modest contributions exceeded those made by all but a very small minority of his fellow trader-collectors.[495]

MacFarlane's collecting activities ceased entirely with his promotion in 1870. He had a fairly successful career after this initial promotion. He was made a Chief Factor in 1887, appointed a Justice of the Peace for the Northwest Territories in 1874, and made an Issuer of Marriage Licenses in 1876.[496] Last, but not least, he was also married in 1870. He married Ann, the daughter of Chief Trader Alexander Christie Jr., and she and MacFarlane had eight children.[497]

After 1870, MacFarlane's compulsion to collect had subsided. He had obtained new responsibilities within the trade, and soon had a family, as well as a wife. MacFarlane never lost his interest in science. He continued to correspond with the Smithsonian, eventually published several articles through the Smithsonian press and, between 1886 and 1910, was made a Fellow of several philosophical and scientific societies including the Royal Geographical Society, the Royal Colonial Institute, the Imperial

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[495] See Tables 5.1 and 5.2.

[496] H.B.C.A., PAM, A.10/82b, fo.194,196. See also "Retired Chief Factor R. MacFarlane," p.6 and letter from Alexander Morris Papers, PAM, MG12 B1 #1934.

[497] MacFarlane took great pleasure in recounting the genealogy of his wife's family. They were an illustrious group, her grandfather being Alexander Christie Senior, and there were several other fur trade notables including A.K. Isbister.

Institute, the American Ornithological Society and the National Geographic Society (United States.)[498] But the many years spent labouring as a clerk were finally behind him, as were his collecting activities.

HBC collectors therefore fell into one of two groups. Collecting provided a venue through which prestige and recognition could be obtained by company men who were disenchanted with their corporate status. The officers who became prodigious collectors for the Smithsonian shared a certain amount of disaffection with regards to their employer. Men such as Ross, MacFarlane, Jones and Lockhart often felt inadequately rewarded for their years of service in the trade. Collecting for the Smithsonian promised to redress their grievances, albeit outside of the corporate hierarchy. Science had its own reward system, and the HBC collectors could conceivably garner the respect and the recognition that they craved from the scientific community. Collecting therefore had an undeniably redemptive quality.

Servant-collectors formed the second group of HBC employee-collectors. Their participation was, however, short-lived. The correlation between thwarted career aspirations and collecting did not apply to the more poorly educated labourers, tripmen, bowsmen, fishermen, interpreters and even postmasters who collected briefly for

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[498] "Retired Chief Factor R. MacFarlane," p.7. See Chapter 8 for a list of MacFarlane's publications.

the Smithsonian. Their grievances against the company could not be resolved through recognition in scientific journals. More importantly, it was difficult for the working class to sustain an interest in activities that differed specifically, but not generally, from the many other time consuming and physically taxing duties assigned them. Specimens were only acquired after countless hours hunting for nests and eggs, crouching in swamps and tramping over tundra. These outdoor activities were followed by considerably more hours at skinning, preserving and packing the specimens destined for the Smithsonian. These men were accustomed to being paid for not dissimilar work. Kennicott could occasionally cajole them into collecting, or he could "purchase" their assistance with tobacco, alcohol, tea or sugar, but these men were unwilling to persevere as unpaid volunteer collectors.

Kennicott's infectious enthusiasm and undying dedication to the study of natural history were undoubtedly crucial to the realization of the Smithsonian program, but the collections sent south from the sub-arctic represented an effort which far exceeded the capabilities of one man, or even four men. They also exceeded the returns to be expected from hobbyists. Neither tedium nor recreation provided adequate incentive to amass collections on a grand scale, and the exertions of the Mackenzie River people had surpassed any previous collecting activities in Rupert's

Land. Collectors such as Ross, MacFarlane, Lockhart and Kennicott did devote much of their time and energy to collecting, but they also recruited others to perform many of the menial tasks inseparable from the process. Collecting was a business in which a large percentage of the process consisted of just plain hard work. Prominent collectors relied heavily on the more poorly educated, manual labourers of the District to carry out this work. Some of these people like Reid, Taylor, Flett and Sibbeston were of European descent, but much of the labour was provided by the Indian, Inuit and mixed-bloods of the region.

Chapter VI

FIELDWORK: A LABOUR OF LOVE, OR JUST PLAIN LABOUR?

Upon his arrival in the north Kennicott found an indigenous population that was amiable, or at least not overtly hostile, to his presence and his activities. Many Indians and Inuit had already had considerable experience with European socio-economic values. The HBC had created a socio-economic system in which trade goods were exchanged for the products of native labour, and the core of European emigres with whom they peacefully existed, facilitated Kennicott's attempts to exploit the indigenous labour pool. The HBC employees became as adept at harnessing native labour to the collecting process as they had been at exploiting native labour in the fur trade. And while northerners were not yet dependent on European goods, they coveted them to the extent that they could be persuaded to participate in the collecting process. The Smithsonian intrusion into the north offered another opportunity for the native population to exchange their labours for European and American goods. It offered, in essence, another avenue through which to perpetuate an existing trade relationship.[499] Specimen exchange was incorporated within

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[499] Douglas Cole has demonstrated the economic value of

the partnership already established at the HBC posts, and the indigenous population once again supplied the labour needed to exploit northern resources.

Experience had taught scientists that natives were their most useful allies. They were very adept at capturing natural history specimens, and were generally familiar with the locations frequented for breeding and feeding. Alfred Newton was certainly aware of the advantages of having a large contingent of indigenous collectors working on his behalf. In a pamphlet attached to Brewer's "Intructions for Oological Collecting," Newton urged all naturalists to cultivate and reward native initiatives:

> The best allies of the collector are the residents in the country, whether aboriginal or settlers, and with them he should always endeavor to cultivate a close intimacy, which may be assisted by the offer of small rewards for the discovery of nests or eggs. He should, however, always insist upon any nests found being shown to him *in situ*, and the gratuities paid should be proportioned to his success in identifying the species to which they belong.[500]

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ethnological artifacts in his study of collecting on the Northwest Coast, and he concludes: "The collecting process was a trading relationship affected by normal economic factors of supply and demand, competition, accessibility, costs of transportation, by wars and trade cycles, by ethnological fashion and museum budgets." *Captured Heritage*, p.310.

[500] Alfred Newton, "Suggestions for forming Collections of Birds' Eggs," Appendix to "Circular in Reference to Collecting Nests and Eggs of North American Birds," Smithsonian *Miscellaneous Collections*, 139, vol.2,1862,pp.10-22.

Thomas Mayo Brewer also recommended the use of native collectors and stated in his "Instructions:"

> The services of boys and other persons on farms, plantations, etc., may be called to great advantage into requisition in collecting eggs. Whenever they have found a nest, however, it should not be disturbed before information is communicated to, and the spot visited by some one competent to determine the species, unless the parent can be taken with the nest.[501]

Nineteenth century naturalists were more than willing to exploit native knowledge and energy, but native identifications, although admittedly important, were supplementary to even the common English names used to identify zoological specimens. Both Newton and Brewer were particularly careful to point out that the "savages" or "half civilized" had intellectual limitations, particularly in their ability to comprehend scientific matters. Eggs collected by untrained naturalists must never, therefore, masquerade as having been collected otherwise:

> For eggs not taken by the collector himself, but brought in by natives, or persons not having a scientific knowledge of ornithology, the <u>local name</u> or the <u>name applied by the finder</u> should <u>only</u> be used, unless indeed it requires interpretation, when the scientific name may be added, but <u>always within</u> brackets,[502]

Both native and common nomenclature were viewed as inferior, if not incidental, to the scientific system.

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[501] T.M. Brewer, "Intructions for Oological Collecting," p.3.

[502] Ibid., p.13.

Within one year of Kennicott's arrival in the Mackenzie River District he had discovered the truth of Brewer and Newton's advice regarding native assistance. His collections for 1859 had been pitifully small, and although their size could be accounted for somewhat by the lateness of his arrival (August), he had obviously encountered some difficulties in his attempts to arouse native support for his project. He was exasperated with the restive dispositions that he perceived as characterizing the Indians who lived near Fort Resolution:

> [The Indians are] the most unobliging imaginable and as big rascals as such idiots _can_ be. I can scarce get anything from them, and what few specimens I do get I must pay large prices for. So long as an Indian isnt hungry - or in fact _very_ hungry - he is as independant [sic] as you please and quite scorns the idea of working for any-thing less than very large pay, if he will work at all.[503]

Although he eventually convinced as many as eleven percent of the people directly employed by the HBC to collect on behalf of the Smithsonian,[504] this was an entirely

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[503] Letter from Kennicott to Baird, 29 June 1860, SIA, RU 7215, Box 13.

[504] This percentage has been calculated on the basis of total population at the HBC posts because both women and children were also employed in collecting activities. There is some uncertainty in the calculated percentage involvement in scientific activities because the only population estimates available are found in the census done by James Hunter in 1858, but his accounting of the number of persons directly employed by the HBC in 1858 seems to accurately reflect employment practices throughout the 1860s. Both summer and winter appointments were recorded in the _Minutes of Council, Northern Department_, and they remained fairly stable throughout the period in question. See: _Minutes of Council, Northern Department_, H.B.C.A., PAM, B.239/k/3 and James Hunter, "Census of Population of Mackenzie

inadequate contingent to procure a large collection.

Reservations about native capabilities and initiative were also expressed by the HBC traders. W.J. McLean, the clerk stationed at Fort aux Liards in 1867, stated:

> I have on several occasions spoken to the Indians of this place, to procure me any rare or valuable specimen that they meet with, but they are so very stupid, that when they do bring me any, they spoil them in stuffing after they skin them, and the birds look quite different to what they originally were.[505]

John Isbister complained that Indians he had personally taught to prepare specimens preferred to feign ignorance rather than cooperate in his projects, and Donald Gunn, one of the earliest contributors of natural history and ethnographic specimens to the Smithsonian, also noted that there were difficulties associated in dealing with the natives as collectors.[506] He stated that Indians were not only unreliable but uncooperative since they preferred to eat, rather than collect eggs. Moreover, Indians were capable of becoming very astute negotiators once aware of

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River District," 1 June 1858, PAM, Church Missionary Society, A.90.

505 Letter from McLean to Baird, 17 Nov. 1867, SIA, HBC Corr Coll, Folder 32. McLean's contempt for the Indians was only surpassed by his indifference to collecting. He had received instructions for collecting in the Spring of 1864, and while stating his interest for natural history, he never managed to exert himself beyond vocal support for the Smithsonian's programs. See: letter from McLean to Kennicott, 17 Nov. 1864, SIA, HBC Corr Coll, Folder 32.

506 Information found in list of specimens sent by Isbister to Donald Gunn, n.d., Donald Gunn Collection, SIA, RU 7215, Box 10.

the value of an article.[507] R.R. MacFarlane, who generally acknowledged gratefully the efforts made by native collectors, attributed errors made in packing his specimens to the "stupidity of Indians."[508] And Laurence Clarke and B.R. Ross criticized, somewhat circuituously, native capabilities as useful "auxiliaries." They stated that superstitious beliefs prevented natives from collecting, implying that the "primitive" beliefs of the Indian and Inuit thwarted the Smithsonian's objectives.[509] Overt criticisms of native productivity, aptitude and cooperation were, however, generally momentary and usually indicative of the shortcomings of an individual HBC collector who, when grouped with his fellow trader-collectors, formed a simply somewhat more sophisticated source of indigenous labour to the American naturalists.

Despite such castigatory remarks, Kennicott set about converting both trader and trapper into collectors as soon as he was established at Fort Simpson. His proselytizing was incessant. By the end of his first three months at Fort Simpson, he had already begun to see the results of his relentless efforts to convince others to collect specimens.

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[507] Letter from Gunn to Baird, 4 June 1856, SIA, RU 305, Reel 6, and letter from Gunn to Baird, 24 Dec. 1858, SIA, RU 305, Reel 7.

[508] Letter from MacFarlane to Baird, 6 May 1863, R.R. MacFarlane Collection, SIA, RU 7215, Box 14.

[509] Letter from Ross to Baird, 10 Nov. 1860, SIA, HBC Corr Coll, Folder 36 and letter from Clarke to Baird, 21 June 1861, SIA, HBC Corr Coll, Folder 9.

The first Indian and Inuit "parties" brought specimens to him at Fort Simpson, and while there, he taught them how to skin their specimens.[510] Kennicott instructed women and boys, as well as the men to skin and preserve specimens. And he had great faith in the abilities of native collectors. He viewed Inuit people as particularly intelligent and noted that some were able to master the art of skinning after just one lesson.[511]

Kennicott's first batch of specimens contained several skins that had been prepared by Inuit collectors. Over the winter of 1859-60 Kennicott also taught a "small savage" the techniques involved in skinning natural history specimens. This Indian boy learned the craft of skinning with some success and during March, when Bernard Ross had gone on a collecting binge, the boy was kept "hunting and skinning all the time."[512] Ross, like Kennicott, recognized that significant numbers of specimens could only be processed through the efforts of many people, although he was especially guilty of assuming credit for the efforts of

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[510] Letter from Kennicott to Baird, 17 Nov. 1859, SIA, RU 7215, Box 13.

[511] This is a particularly revealing remark since Dr. S.G. Sealy, Department of Zoology, University of Manitoba, states that proficiency in the techniques associated with the preparation of study skins is acquired only after several years practice, and certainly the first few attempts can take as long as one day per skin. Telephone conversation: 11 May 1988.

[512] Letter from Kennicott to Baird, 23 March 1860, SIA, RU 7215, Box 13.

others.[513]

Collecting, particularly oological collecting, had begun in earnest by June, and Ross made it his business to supervise and coordinate the collections made in the vicinity of Forts Simpson, Liard, Halkett and Big Island.[514] Ross was prone to self-aggrandizement, and certainly never minimized his contributions to any collecting activities associated with the Mackenzie River District. But his dependence on native assistance is all too obvious. The majority of Ross' collections of 1860 had actually been skinned by William Flett, the mixed blood son of Orkneyman James Flett. Flett became quite proficient at specimen preservation, and Ross proudly pointed out that he had supervised the entire operation associated with getting the specimens ready for export.[515] Ross preferred to delegate the menial labour to his "deputy skinners."[516] He thereby

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[513] In addition to assuming the credit for collections made by Indian and Inuit, Ross was also accused of taking credit for collections made by his fellow HBC collectors. John Reid, for example, noted that many of his contributions, sent through Ross, went unacknowledged, and Lawrence Clarke also complained about Ross' cavalier attitude to his collecting efforts. See, letter from Reid to Baird, 8 Dec. 1863, and Clarke to Kennicott, 1 Dec. 1864, 5 Aug. 1863 and 16 Jan. 1865. SIA, HBC Corr Coll, Folders 35 and 9.

[514] Letter from Ross to Baird, 20 June 1860, SIA, HBC Corr Coll, Folder 36.

[515] Letter from Kennicott to Baird, 21 Jan. 1862, SIA, RU 7215, Box 13.

[516] Ross admitted to skinning only one hundred of the five hundred and seven specimens that had been collected between March and June, 1860. Ibid.

avoided the labour associated with processing the specimens, assuming responsibilty for what he viewed as the more important tasks involved in measuring and identifying specimens. Moreover, he absolved himself from any responsibility for errors found in his collections.

The spring of 1860 was Kennicott's first season in the Arctic breeding grounds, and since oological collections were limited by the length of the breeding season, he spent the majority of his time collecting birds and eggs. He had a native person skinning specimens as he collected them, rationalizing this division of labour on the argument that his skills as a naturalist were better utilized in the field than in the workroom. But Kennicott, at any rate, avoided skinning when possible. The American naturalist lamented his shortcomings in the art of skinning. He never took less than half an hour to skin even a small specimen, and so he entrusted all of the more common specimens to his native skinners. In 1860, most of Kennicott's ornithological specimens were skinned by an Indian woman whom he had trained that season, although he did take time out from his collecting to process the rarer ornithological specimens that had been collected for purposes of oological identification.

Kennicott often discussed the people he had trained in his letters to Baird. He wrote: "I have taught an Indian woman ... to skin birds pretty decently - tho she makes no really good skins - and have her skin those I havent time to do - nearly all of the parents of eggs are her skins."[517] When he taught skinning procedures to the Indians at Big Island, he again found that one woman "made very decent skins ..."[518] But then Kennicott often found native women particularly helpful to his collecting activities. One "Indian wife" could unequivocably and correctly identify some rare oological specimens after having sighted the parents.[519]

Kennicott quickly adopted a northern attitude towards Indian women, and following his first journey to Fort Yukon in the Autumn of 1860 he also recommended Indian women for their strength and endurance. He hired six Indians, both men and women, to haul his outfit across the mountains to La Pierre's House, and he noted that: "... the Peel's River "gals" <u>are</u> "strong" without mistake, for some small <u>wives</u> no larger than a southern girl of ten or twelve years old carried loads of fifty or sixty pounds across the mountains."[520]

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[517] Letter from Kennicott to Baird, 29 June 1860. SIA, RU 7215, Box 13.

[518] Ibid.

[519] Letter from Kennicott to Baird, 21 Jan. 1862, SIA, RU 7215, Box 13.

[520] Letter from Kennicott to Baird, 18 Dec. 1860, SIA, RU 7215, Box 13.

With native assistance Kennicott arrived at Fort Yukon in December 1860, and once established at the Fort he became preoccupied with trapping furs. He set about trapping his own series of specimens, just as he had done previously at Fort Simpson. He was again unable to pay the HBC rate for luxury furs, although he could apparently afford to pay for small animal skins and he "... instructed the Indians to bring in porcupines, ermines, mice, shrews, ermines [sic], marmots etc etc..."[521]

While at Fort Yukon, Kennicott also scouted about for the native assistants needed for the spring collecting season. He was confident that come spring he would have at least one hundred Indian boys hunting nests, and he promised Baird that their energies would be devoted to oology in the breeding season.[522] By the end of May, Kennicott, James Lockhart and several Indian assistants were spending eighteen hours a day in the fields collecting eggs.[523] Their relentless pace was permitted by the twenty-four hours of daylight which characterize northern summers, and by the fortitude of the natives who manned the canoes and waded through swamps, ferreting out water birds and uncovering

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[521] See letters from Kennicott to Baird, 17 Nov. 1859 and 18 Dec. 1860, SIA, RU 7215, Box 13.

[522] Letter from Kennicott to Baird, 18 Dec. 1860, SIA, RU 7215, Box 13.

[523] Journal of Robert Kennicott, May 19, 1859 - February 11, 1862, in The First Scientific Exploration of Russian America and the Purchase of Alaska, ed. J.A. James, pp. 83-84.

nests:

> From the last of May till now (June 24th) Lockhart and I have been at work generally about eighteen hours out of every twenty-four. As it is light all night (indeed for a week we see the sun at midnight, by refraction, I suppose), we pay little attention to the time of day, but just work as long as we can keep awake. We start off from the fort with several Indians and canoes, and go through a series of lakes, making portages between these and the various small rivers (both lakes and rivers are very numerous), thus making a turn of fifty to one hundred miles in two or three days. We always go with at least two canoes and a party of four, and when we enter a lake one of the occupants of one canoe hunt in it through the grass at the edge of the lake where the loons, grebes, and canvas-back ducks nest, while his companion wades in the shallow water among the grass, near shore, where we get _Fulix marila_ and _F. affinis_ (scaup ducks) eggs, and sometimes a nest of _Dafila acuta_ (pin-tail duck), that is near the water, or a canvas-back duck in shoal water. The nests are found by seeing the female rise from them. For widgeon's eggs we hunt through the bushes, and for pin-tail ducks, too, generally. When we find spots that seem to promise good breeding ground ashore, we leave the canoes and hunt through the woods and open, dry spots. We camp during the middle of the day at some good point for collecting, nominally to sleep, but, in fact, we sleep very little. I was at one time out three days, in which time I slept only once, and then scarce six hours, when I had already been forty-eight hours without sleep. I am making up for last winter's hibernation.
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> The hunting in the canoes is glorious sport, but unfortunately we do not get the best collections in them, but while wading, or on land, in both of which situations the mosquitoes are _horrible_ beyond all conception. I often long for a temperature of 50 or 60 below zero that I might be relieved from them. It is not the cold, but the mosquitoe, that is the hardest thing to endure in the north.[524]

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[524] Ibid., p.83. This is one of the only extant accounts relating to HBC-Smithsonian collecting that actually describes a process which even the experts such as Baird, Brewer and Newton viewed as intuitive, rather than demonstrative.

Kennicott's reliance on native cooperation grew proportionate to the length of time that he stayed in the north, and he depended heavily on the cooperation of "Red-Leggins" or Ba-Kich-na-chah-teh, the Black River chief of the Kutch-a-kutch-in. This chief not only brought Kennicott "the best things I have obtained from [the] Indians, but has made his Chil-a-ques (young men) collect for me too."[525] Kennicott increasingly exchanged trade goods and provisions for specimens. Individual Indians brought specimens along with their furs to the trading posts, and many more specimens were obtained through contractual arrangements. Kennicott soon found that the latter arrangement assured the best collecions. He wrote Baird that: "We get very little of value from the Indians, in oology at least, unless they are thus regularly engaged -"[526]

Soon after his arrival at Fort Yukon, Kennicott hired Antoine Hoole, a "half breed" interpreter, to collect specimens. Hoole's reliability and intelligence had been recommended to Kennicott by Chief Trader W.L. Hardisty, and Kennicott immediately taught him how to collect and preserve natural history specimens. Kennicott, however, soon recognized that as an interpreter, Hoole could facilitate the recruitment of many Indian and Inuit collectors.

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[525] Robert Kennicott, "The Journal of Robert Kennicott, May 19, 1859 - February 11, 1862," ed., James A. James, Ibid. p.84

[526] Letter from Kennicott to Baird, 23 June 1861, SIA, RU 7215, Box 13.

Kennicott therefore seconded Hoole's multilingual talents, and his influence in the native community, to organize and coordinate a contingent of native collectors. Kennicott had Hoole "tell every Indian who comes to the fort to bring certain special desiderata," and he also used Hoole's talents as a translator to train a "savage taxidermist" and three "savage collectors."

Hoole was well aware of the importance of his new position, and began instructing others with relish:

> The Indians too will then know what is wanted; and I shall not let any of them leave the fort this summer without receiving a long lecture from Antoine upon the immense importance to science of Lockhart's receiving 5000 eggs of wax wing, Picoides, swan, Hawk owl & the like.[527]

Kennicott was equally appreciative of Hoole's usefulness:

> Antoine Hoole the interpreter of the post is as I have said a very keen hunter and takes kindly to the collecting, in which I have gotten him thoroughly interested; and he declares there shall be a very loud cry of bereavement among the parents of rare eggs every spring hereafter throughout this region. I consider his work and interest with the Indians a matter of prime importance to arctic zoological operations. I have bribed him with many very acceptable presents and shall give some of the things sent from The Grove for my own use - That accordian you sent he has been very anxious to get,- as he will. I have promised him that so long as he will collect for the gentleman in charge here I'll send him annually from the States after my return things which he is highly delighted in the expectation of.[528]

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[527] Ibid.

[528] Ibid. Kennicott was also planning a study of the Kutcha Kutchin language based on Hoole's interpretive talents. Kennicott planned to have the interpreter, who spoke

Kennicott's attempts to enlist collectors for the Smithsonian Institution were incessant. He attempted to convince the "Youcon Indians" to collect for Lockhart in January (1862), and while resting at La Pierre's House as he made his way south from the Yukon, he had also tried to convince James Flett, Postmaster of La Pierre's House, to collect for the Smithsonian.[529] In February, Kennicott reached Fort Good Hope, where he stayed six weeks before leaving for Fort Simpson to catch the Portage La Loche Brigade. The Metis brigade would take him out of the Mackenzie River District, beginning his journey southward to the United States,[530] but while at Fort Good Hope Kennicott talked to MacFarlane and Julian Onion on the importance of collecting for the Smithsonian. Before leaving, he also gave elementary lessons in collecting to some of the fort Indians.

MacFarlane had previously had only a casual interest in collecting, but he became consumed with the "oological fever" following Kennicott's stopover at Good Hope.[531] When

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Kutcha Kutchin "better than a native," assist in the preparation of a philological work, and even though Hoole's interpretative activities were his most important function, Kennicott also expected Hoole to personally prepare the oological specimens.

529 Letter from Kennicott to Baird, 21 Jan. 1862, SIA, RU 7215, Box 13.

530 Letter from Kennicott to Baird, 29 Oct. 1862, SIA, RU 7215, Box 13.

531 MacFarlane's collections were to become the single largest natural history and ethnographic contribution leaving the north for the Smithsonian, see Table 5.1.

he arrived at his summer posting at Fort Anderson on 29 May, he immediately sent local Indians and "Esquimaux" in search of eggs.[532] Three weeks later on 19 June, he left Fort Anderson on a seventeen day overland egging expedition to Franklin Bay. MacFarlane was accompanied by five Indians, whose expertise in identification and habitat was crucial to the success of his expedition. One of his native assistants risked life and limb in a futile effort to obtain specimens, and MacFarlane's correspondence to Baird contains a vivid account of the perils encountered in collecting a clutch of golden or ring-tailed eagle (Aquila chrysaetus) eggs.

These eggs were perched thirty feet from the summit of the face of a sixty to seventy foot embankment. One of MacFarlane's Indian assistants climbed up the cliff, removed the eggs, brought them to MacFarlane for examination, and then returned them to the nest in hopes that the mother would reappear. MacFarlane and his crew waited three hours before abandoning their watch, without once sighting the mother. They also checked the nest on their return from the Arctic Coast, but the mother had vanished. They had therefore spent several fruitless hours attempting to verify their preliminary identification through corroboration with an adult specimen.

MacFarlane's interest in collecting is referred to in a letter from Lockhart to Baird, 7 Dec. 1862, SIA, HBC Corr Coll, Folder 26.

[532] Letter from MacFarlane to Baird, 28 July 1862, SIA, RU 7215, Box 14.

This experience shows collecting for what it was - time consuming, tedious, and even dangerous. MacFarlane's anecdote alludes to the large amount of time invested in specimen collection. Inexperience was undoubtedly an important factor in initially prolonging the collecting process, but collecting and preparing specimens was an exacting and time consuming activity, and if several hours were spent obtaining each specimen, the amount of time invested by northern collectors was substantial. However, MacFarlane nevertheless promised that "great" collections would be forthcoming. He was sure that once his Indians were made aware of the Smithsonian's needs, and once they had become proficient in the capture and preparation of specimens, they would be prodigious collectors. Expertise could, MacFarlane assured Baird, be developed through instruction and experience.[533] And once developed, MacFarlane benefited immensely from the labour, expertise and cooperation of his Indian and Inuit collectors while forming the "Anderson Collections."[534] He dispatched Indians and Inuit "at every opportunity," and some reference to the

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[533] Letter from MacFarlane to Baird, 6 May 1863, SIA, RU 7215, Box 14.

[534] For example, MacFarlane took another party of Indians on a second overland expedition in search of eggs. He doubled the number of native assistants taken on his journey to the Arctic Ocean in the Spring of 1864. See letters from MacFarlane to Baird, 10 May 1864, and 28 July 1862, 20 Jan. 1866, SIA, RU 7215, Box 14 and a letter written during 1863, SIA, HBC Corr Coll., Folder 30. Other correspondence between MacFarlane and Baird also mentions his reliance on native collectors, see letters dated 3 Sept. 1862 and 9 Feb. 1863. SIA, RU 7215 Box 14.

contributions made by his native assistants is even found in the History of North American Birds.[535]

George Barnston and Donald Gunn also relied on native labour for their collections. Barnston, for example, referred specifically to his "superintending" activities. He supervised the skinning, disjointing, boiling and scraping of bones by a "halfbreed" hunter, a young Indian, and two women, and his trust in native opinion regarding species differentiation was unequivocal.[536] He sent Baird a specimen of the Bear Trout or "Macqua" and suggested that if it was a distinct variety of trout, as the Indians had said it was, then its scientific name should be derived from the Indian name. He therefore suggested Ursina for the species name of the trout.[537]

Donald Gunn also appreciated the value of native knowledge to identification:

> It is true, I could have gone to the Lakes without an Indian and secured plenty Eggs and some parent birds, - but many sets of these Eggs parentage I

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[535] See, vol.2., p.205 and 394; vol.3., p.309 and 460.

[536] Letter from Barnston to Baird, 15 March 1860, SIA, HBC Corr Coll, Folder 2.

[537] Barnston some two years later also related the rationale behind the native differentiation between two varieties of otter and between two varieties of fish, and Barnston asked Baird to name what he felt was a separate species of otter, after the Indian name for the animal - destructor. Moreover, Barnston also accepted the Indians' claim that Salmo siseocuet and Salmo mucqua were "distinct fish." The Indians supported their claim by pointing out that the two fish had different spawning seasons. See, letter from Barnston to Baird, 28 Jan. 1862, SIA, HBC Corr Coll, Folder 2.

> could not identify and would on that account be of little or no value - Whereas an Indian on securing an Egg knows at once what kind of bird is its parent.[538]

He had been purchasing nests and eggs from indigenous collectors for some time. Gunn first referred to purchasing a bear skin from the Indians in 1856, and one year later he sent Baird specimens that were not only collected but skinned and stuffed by the Indians. In 1858 Gunn promised Baird that he would request the "Indians in my service" to collect eggs in the region of Lake Winnipeg, and he again referred to buying nests and eggs, bribing the Indians to collect for him and employing some Indian boys for the breeding season in 1862 and 1864.[539]

Gunn also agreed with Kennicott that the best collections were obtained by "engaging" native collectors, and Gunn estimated that the costs of a proposed "egging expedition" to Lake Winnipeg would be nominal. Wages for assistants would cost between £ 8-10, with each man engaged for the trip earning approximately 4 shillings and boys earning from one to two shillings.[540]

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[538] Letter from Gunn to Baird, 16 June 1866, SIA, HBC Corr Coll, Folder 20.

[539] See letters from Gunn to Baird, 4 June 1856, SIA, RU 305, Reel 6; 2 June 1857, SIA, RU 7215, Box 10; 24 Dec. 1858, SIA, RU 305, Reel 7; and May 1862 and 3 August 1864, SIA, HBC Corr Coll, Folder 20.

[540] Letter from Gunn to Baird, 27 Dec. 1864, SIA, HBC Corr Coll, Folder 20.

The HBC collectors were fully cognizant of, if generally uncommunicative about, the indispensability of native assistance in specimen collection. Official HBC collectors indicated only superficially their dependence on native expertise in the collection and preservation of their specimens, although Kennicott gave Lockhart five pounds of tea to trade for tobacco and £ 5 with which to purchase the trade goods needed in exchange for specimens collected by the Indians.[541] Ross, for example, rarely admitted to having native assistance. He did not, however, hesitate to employ Indians to brave the hordes of mosquitos that plagued the spring breeding grounds.[542] Charles Gaudet was also assisted by native collectors, relying heavily on two Indian collectors in 1864.[543] Strachan Jones also sent an Indian into the Rocky Mountains to collect on his behalf in 1865.[544] James Lockhart engaged Francois Beaulieu to collect eggs at Salt River in 1864, and he recruited Olivier Laferte to collect specimens at Fort Rae in the Spring of 1865.[545]

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[541] Letter from Kennicott to Baird, 23 June 1861, SIA, RU 7215, Box 13.

[542] Letter from Ross to Baird, 20 June 1860, SIA, HBC Corr Coll, Folder 36.

[543] Letter from Gaudet to Kennicott, 14 Sept. 1864, SIA, HBC Corr Coll, Folder 18.

[544] Letter from Jones to Baird, 27 Nov. 1865, SIA, HBC Corr Coll, Folder 24.

[545] Letter from Lockhart to Baird, 28 Nov. 1864, SIA, HBC Corr Coll, Folder 26. See also, letter from Lockhart to Kennicott, 5 Dec. 1864, SIA, HBC Corr Coll, Folder 26.

While most native participation undoubtedly went unrecorded and unrecognized native collectors were invaluable assistants. Kennicott had instructed several Indians in general collecting and preservation techniques, making them more adept at collecting and preservation than an "untrained" European. All northerners could claim some expertise at skinning and preparing the skins of fur-bearing animals, but the majority of the specimens sent to the Smithsonian were ornithological and oological, and the skinning and preservation of these specimens differed enough from ordinary skinning procedures to necessitate specific training. Both native and European had to be <u>taught</u> the procedures for the preparation of scientific study skins. Hoole and his assistants, for example, had received rigorous instruction and were indispensable to Kennicott's expedition despite their alleged primitiveness.

Native collectors were infinitely more skilled than most of the HBC traders. They could be far more proficient at specimen preparation than Strachan Jones, who recognized his limitations as a skinner, or R.R. MacFarlane, who characterized many of his specimens as only "indifferently prepared" due to insufficient supplies and due to the fact that he had "not the least taste for the art of taxidermy."[546] James Lockhart, who became one of the most prodigious contributors to the Smithsonian collections, also

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[546] Letter from Jones to Baird, 8 July 1867, SIA, HBC Corr Coll, Folder 24, and letter from MacFarlane to Kennicott, 7 Feb. 1865, SIA, RU 7215, Box 14.

regretted his ineptitude at skinning:

> ... when I arrived here autumn 1859, I began skinning, or rather attempting to skin birds & beasts - all that came in my way, but after a dozen failures, I gave up in despair and determined that I would do nothing until I could learn how to do it <u>properly</u>: for I was then aware that Mr. Kennicott would be wintering here with me, and would put me through, what he calls, "a course of sprouts." This he has very kindly done, and has taken an immense deal of trouble to drive into my thick head and clumsy fingers, the thousand little minutia of collecting generally.[547]

Aptitude and inclination were perhaps a reflection of individual predispositions, but technical expertise could only be developed through instruction. Disappointment and discouragement accompanied every batch of specimens that spoiled before reaching Washington, and some specimens did not even make it from the outlying areas into Fort Simpson without spoiling. Nicol Taylor, for example, packaged up a large case of specimens at Fort Norman, but when they were opened for repacking at Fort Simpson, they were found spoiled due to insufficient drying.[548] A collection of bird skins made at Peel's River by Charles Gaudet was also spoiled due to improper preservation.[549] Some Fort Simpson specimens that had been skinned improperly, only narrowly escaped spoiling. They were saved through being

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[547] Letter from James Lockhart to Baird, 24 June 1861, SIA, HBC Corr Coll, Folder 23.

[548] Letter from Kennicott to Baird, 8 July 1861, SIA, RU 7215, Box 13.

[549] Letter from Kennicott to Baird, 21 Jan. 1862, SIA, RU 7215, Box 13.

inadvertently over-dryed.[550] And R.R. MacFarlane reported massive spoilage of his oological specimens as a result of not removing the embryos.[551]

Technical proficiency was indispensable to the success of the Smithsonian natural history program. The recruitment of regionally based collectors was also integral to any such success, and Kennicott's evangelical and pedagogical talents played a key role in both building up and training a northern contingent. His devotion to science and his persuasiveness convinced many northerners of the importance of the Smithsonian's specimen needs, and his lessons prepared the uninitiated for their new vocation as taxidermists. Continued exports to the Smithsonian were, however, only assured through sensitivity for the field collectors' needs. Kennicott and Baird dispensed both recognition and remuneration. Arctic specimens became the basis of an exchange system in which the efforts of collectors were rewarded with goods, salaries or prestige.

Men, women and children were all integrated within the expanded trade network. Raisins and sugar were used to convince youngsters to collect easily accessible specimens, but most native collectors received American goods in return

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[550] Letter from Ross to Baird, 20 June 1860, SIA, HBC Corr Coll, Folder 36.

[551] Letter from MacFarlane to Baird, 10 May 1864, R.R. MacFarlane Collection SIA, RU 7215, Box 14.

for their efforts.[552] Handkerchiefs, silk ribbons and hat cords, jewelry, cotton and calico textiles, calico shirts, feathers, pipe heads, pocket knives, needles, thread and tobacco formed the majority of the goods offered in exchange for specimens.[553] Double barrelled guns were occasionally offered to the best collectors,[554] both native and European, as well other eminently practical items. Baird sent collecting apparatus, dissecting kits, microscopes, "spy" glasses, and pocket compasses, as well as revolvers and felt hats, mosquito nets and dog bells, pipes and opera glasses, dog blankets and burning glasses.[555]

He also sent gifts to the country-born wives and families of some of the northern collectors. European and Indian or European and Mixed Blood marriages were still common at the Mackenzie River District among the servant class, and both Sibbeston and Reid had "pure Indian" wives.[556] Nicol Taylor

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552 Letter from Kennicott to Baird, 29 June 1860, SIA, RU 7215, Box 13.

553 Information on the goods traded for specimens comes from a list of trade goods, personal provisions and scientific materials and apparatus requested by Kennicott, April and June 1860, as well as from letters written by Kennicott to Baird, 29 June and 1 Sept, 1860. See: Smithsonian Institution Exploration, 1852-76, HBC Territory Expedition, 1859-62, SIA, RU 7002, Collection Division 13, Box 66, and Kennicott Correspondence, SIA, RU 7215, Box 13.

554 Letter from Kennicott to Baird, 18 Dec. 1860, SIA, RU 7215, Box 13.

555 SIA, RU 7002, Box 66.

556 "List of Presents sent to Arctic Correspondents," SIA, HBC Corr Coll, Folder 41.

caused quite a sensation when he married an American dressmaker who had been visiting the District during the summer of 1864, but C.P. Gaudet, a Canadian-born recruit, had a mixed-blood wife and family, as did Andrew Flett and all the labourers.[557] Jane, the wife of James Dunlop, was of mixed ancestry and James Flett had married a native woman.[558] The Gaudet, Sibbeston, Reid, McLean and Hardisty families received dyes, "crying doll babies," belt buckles, glass necklaces, beads, scissors, silk thread, buttons, hair pins, hair nets and handkerchiefs.[559]

Baird also shipped hundreds of books to his northern correspondents. He sent them novels and poetry, the Smithsonian publications and other recently published scientific works, as well as scholarly and popular studies in history, philosophy and theology.[560] Books formed the single largest category of presents sent north from the United States, but collectors also received alcohol and

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[557] Letter from Lockhart to Kennicott, 21 Nov. 1864 SIA, HBC Corr Coll, Folder 26, and letter from Kennicott to Baird, 21 Jan. 1862, SIA, RU 7215, Box 13.

[558] References regarding the fur traders' marital relations are dispersed throughout Kennicott's correspondence and, in Folder 41 of the HBC Corr Coll, there is a "List of Presents sent to Arctic Correspondents" which identifies fur trade wives according to ancestry. Kennicott also made special reference to Flett's "half-breed" son William as an exemplary bird skinner. Letter from Kennicott to Baird, 21 Jan. 1862, SIA, RU 7215, Box 13.

[559] See "Distribution of presents to the wives of correspondents of S.I. in the Mackenzies River District, Spring of 1867," SIA, RU 7002, Box 66.

[560] See Appendix 6 for an example of the books sent by Baird to Ross in 1860.

trinkets for their cooperation. Some items, however, demanded a higher price. Ross paid several pounds for a Kutchin chief's dress.[561] Moreover, Kennicott informed Baird that even ordinary Indian clothing might cost approximately £ 1, while small models would cost something less than a pound apiece.[562] Indian and Inuit craftsmen and women constructed numerous models depicting native technologies. They made models of snow shoes, canoes and kayaks, bows, quivers and arrows, spears, sledges, lodges and even clothing. At least forty-eight of these models were actually received by the Smithsonian Institution between 1859 and 1871.[563]

By 1860 the scientific community had recognized the applicability of systematic data collecting techniques to studies of human populations, but such techniques were found to be most fruitful when indigenous populations cooperated with collectors.[564] Descriptive ethnographers were perhaps

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[561] Letter from Ross to Baird, 10 Nov. 1860, SIA, HBC Corr Coll, Folder 36.

[562] Letter from Kennicott to Baird, 17 Nov. 1859, SIA, RU 7215, Box 13.

[563] Registers, Accession Records, Anthropology Department, Smithsonian Institution, vol.I,II,III. SIA, RU 6690T, or Computer Printout, Ident: MNH4 122G113, MNH-ANN.

[564] This dependency has not been well documented, but is an acknowledged prerequisite by field anthropologists. There are some accounts of the relationship between fieldworkers and communities under study, See especially Elenore S. Bowen [Laura Bohannan], <u>Return to Laughter</u> (Doubleday, 1964), Napoleon Chagnon, <u>The Yanomamo: The Fierce People</u> (Toronto: Holt, Rinehart and Winston,

unaware of their dependency on native acquiescence to their presence, but just as the best collections were made through the assistance of native collectors, craftsmen and craftswomen, or made when natives could be convinced to part with their possessions, the best vocabularies could be constructed, and the most comprehensive accounts of native culture could be recorded when natives actively assisted anthropologists.

Western definitions of science were extraneous to nineteenth century native world views, but both Indian and Inuit were nonetheless active participants in the scientific process. Early anthropological studies, at the very least, depended on native tolerance and passivity. But in many instances, native collectors, interpreters and artisans actively aided nineteenth century ethnographers. They were not only the focus of early anthropological research, they were also the means through which a substantial amount of native material culture came to rest at the Smithsonian. Native culture was fast becoming one of the most eagerly sought after northern commodities and natives could, and did, demand reimbursement for their cooperation.

1968). For a more analytical approach see Pertti J. Pelto, <u>Anthropological Research: The Structure of Inquiry</u> (New York, Evanston and London: Harper & Row Pubs., 1970), and for a historical analysis of the relationship between anthropologists, material culture and native populations see Douglas Cole, "Tricks of the Trade: Northwest Coast Artifact Collecting, 1875-1925," <u>Canadian Historical Review</u>, 63(1982):439-60, and <u>Captured Heritage</u>, pp.294-331.

Chapter VII

THE SMITHSONIAN, THE HBC AND ARCTIC ANTHROPOLOGY

The aboriginal peoples of North America, South America, the South Pacific, Africa and India had been a source of curiosity for some time before the Smithsonian seconded their assistance as artisans and collectors. Native peoples had been described graphically in fur trade journals, tract literature and in travelogues, and all three genres contained information of enormous importance to later anthropologists. But the imperial, corporate and religious imperatives associated with these genres were quite different from the rationale underlying the morphological, phrenological, archaeological, antiquarian, philological and ethnological analyses of "primitive" societies produced in the second half of the nineteenth century.[565] The museum

[565] Studies of the history of anthropology most useful in the construction of a framework of the development of nineteenth century anthropology were: Curtis M. Hinsley Jr., _Savages and Scientists: The Smithsonian Institution and the Development of American Anthropology, 1846-1910_ (Washington: Smithsonian Institution Press, 1981); William Stanton, _The Leopard's Spots: Scientific Attitudes Towards Race in America, 1815-59_ (Chicago: The University of Chicago Press, 1960); Nancy Stepan, _The Idea of Race in Science: Great Britain, 1800-1960_ (London: The Macmillan Press Ltd., 1982); John V. Murra, ed., _American Anthropology: The Early Years_, Proceedings of the American Ethnological Society, 1974 (Town: West Pub. Co., 1976); Robert F. Berkhofer Jr., _The White Man's Indian: Images of the American Indian from Columbus to the Present_ (New York:

ethnologists and private collectors who clamoured to collect native artifacts were as acquisitive as their pre-ethnographic predecessors, but by 1850 native artifacts were collected in the fear that the decline and demise of native society was imminent, and a spirit of reform and reflection was associated with the science of anthropology.[566] The new approach to native studies also differed from pre-ethnographic publications because anthropologists were more consciously theoretical. Mid-nineteenth century ethnographers attempted to rationalize the demise of Amerindian peoples, while explaining the origins and development of "civilized" society.

The customs and appearance of indigenous sub-arctic peoples had been described by persons attached to virtually every major exploratory party that had travelled in the north. Expeditions led by Cook, John Ross, Parry, Back and Franklin each produced some literature on aboriginal peoples

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Alfred A. Knopf, 1978); John Urry, "A history of field methods," in Ethnographic Research: A Guide to General Conduct, ed. R.F. Ellen, Research Methods in Social Anthropology, vol.1 (New York: Academic Press, 1984), pp.35-61; Douglas Cole, Captured Heritage: The Scramble for Northwest Coast Artifacts (1985); George W. Stocking Jr., Victorian Anthropology (New York: The Free Press, A Division of Macmillan Inc., 1987); and two collections of essays edited by Stocking, Observers Observed: Essays on Ethnographic Fieldwork, History of Anthropology, vol.1 (Madison, Wisconsin: The University of Wisconsin Press, 1983) and Objects and Others: Essays on Museums and Material Culture, History of Anthropology, vol.3 (The University of Wisconsin Press, 1985).

566 Hinsley, Savages and Scientists, p.8.

that was referred to as "moral history." Moral history was the term used to describe that part of early exploration literature which described the "customs, fashions, religious beliefs, forms of worship, disposal of the dead, time reckoning, social stratification, government, warfare, and artifacts."[567] and such descriptions were written by the explorers or scientists who accompanied exploratory expeditions.

These travellers were motivated to record their observations out of a simple curiousity, as well as in response to a utilitarianism that had manifested itself formally in "observation guides" as early as 1577,[568] and expeditions were instructed to seek out, make peace and record their impressions of the native population. It was felt that native peoples would be instrumental in providing food and shelter in foreign and unfamiliar lands, and that they could provide the geographical information needed to expedite surveys of the northern coast. Captain James Cook, for example, was given specific instructions in regards to contact with native populations living along the Pacific rim:

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[567] John Honigmann, The Development of Anthropological Ideas, The Dorsey Series in Anthropology (Homewood, Illinois; Arundel, Sussex, and Georgetown, Ontario: The Dorsey Press, 1976), p.60.

[568] Information on early guides found in Honigmann, Ibid, footnote 33, p.76. Honigmann specifically cites Howard F. Cline, "The Relaciones Geograficas of the Spanish Indies 1577-1586," Hispanic American Historical Review, vol.44 (1964):341-374, pp.363-371.

> ... observe the genius, temperament, disposition and number of the natives and inhabitants where you find any and endeavour to cultivate a friendship with them, making presents of trinkets ... invite them to traffic; and shewing them every kind of civility and regard - taking care not to be surprized by them ... also, with consent of natives, take possession, in name of King of Great Britain of such countries not already discovered by some other European power.[569]

Similar, if abbreviated, instructions were given to other expeditions sent in search of the North West Passage.

Fur trade journals, correspondence and private papers provide another major source of pre-ethnographic information on North American native peoples.[570] Fur trade documents are filled with incidental information on North American natives, but traders such as James Isham, Matthew Cocking, Andrew Graham, Samuel Hearne, Alexander Mackenzie, Daniel Harmon, Gabriel Franchere, Peter Skene Ogden and Peter Fidler consciously and purposefully recorded the details of native life.[571] Familiarity with native customs, habits and

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[569] "Secret Instructions for Captain James Cook," from P.H. Stephens, [British Admiralty], in Cook, A Voyage to the Pacific Ocean, vol.1, p.xxxiv.

[570] The term pre-ethnographer is used by Richard Slobodin in his article on Athapaskan ethnography. "Canadian Subarctic Athapaskans in the Literature to 1865," Can. Review of Soc. and Anthro. 12(3):278-89.

[571] James Isham, Observations on Hudson's Bay, 1743, and Notes and Observations on a Book Entitled 'A Voyage to Hudsons Bay in the Dobbs Galley, 1749', ed., E.E. Rich, The Hudson's Bay Record Society (Toronto: The Champlain Society, 1949); Matthew Cocking, An Adventurer from Hudson Bay, Journal of Matthew Cocking from York Factory to the Blackfeet Country, 1772-1773, ed., L.J. Burpee, Transactions of the Royal Society of Canada, Series 3, vol.2, 1908; Andrew Graham, Andrew Graham's Observations on Hudson's Bay, 1767-1791, ed., Glyndwr Williams (London: The Hudson's Bay Record Society, 1969); Samuel

languages was indispensable to the success of any fur trade venture, and although the importance of such knowledge was overwhelmingly apparent to traders who had been posted to Rupert's Land, the Hudson's Bay Company only adopted a policy reflecting that wisdom in 1814.

Corporate priorities were reflected clearly in the instructions sent out by the London Committee to Governor Thomas Thomas. Governor Thomas was directed to have his men collect information on native traders and their families.[572] Reports were to be much more comprehensive than previous requests for information on the appropriate trade goods.[573] They were to include data on the numbers and condition of the Indians trading at each post, giving more specific

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Hearne, _A Journey from Prince of Wale's Fort in Hudson's Bay to the Northern Ocean in the Years 1769, 1770, 1771, and 1772_ [1795], ed., Richard Glover (Toronto: Macmillian, 1958); Sir Alexander Mackenzie, _The Journals and Letters of Sir Alexander Mackenzie_, [1789-1819], ed., W. Kaye Lamb (Cambridge: Cambridge University Press, the Hakluyt Society, 1970); David Thompson, _David Thompson's Narrative, 1784-1812_, ed., Richard Glover, 2nd ed. (Toronto: The Champlain Society, 1962); Peter Fidler, "Journal of a Journey with the Chipewyans or Northern Indians to the Slave Lake and to the East and West of the Slave River, in 1791 and 1792," in _Journals of Samuel Hearne and Phillip Turnor Between the Years 1774 and 1792_, ed., J.B. Tyrrell (Toronto: The Champlain Society, 1934); Daniel Harmon, _Sixteen Years in Indian Country: The Journal of Daniel Williams Harmon, 1800-1816_, ed., W. Kaye Lamb (Toronto: Macmillan, 1957); Gabriel Franchere, _Journal of a Voyage to the Northwest Coast of North America During the Years 1811, 1812, 1813, and 1814, by Gabriel Franchere_, ed., W. Kaye Lamb (Toronto: The Champlain Society, 1969); and Peter Skene Ogden, _Peter Skene Ogden's Snake Country Journals 1824-25 and 1825-26_, ed., E.E. Rich (London: The Hudson's Bay Record Society, 1950).

[572] These instructions were included in a letter from the

information on the Chiefs and hunters attached to the bands in question. The Company was interested in the location and extent of each band's hunting territory, and overseas traders were supposed to comment on native views of private property, particularly in reference to their hunting grounds. Moreover, company officials requested information on broader topics. Traders were asked to take notes on "Their [the Indians'] general condition, as to the means of subsistence or of comfort; & their habits as to industry, attention to their families; & how far they are improved in these respects or the reverse."[574] These topics had undeniably economic overtones.

Missionization also produced a literature, or "moral history" of North American natives. Roman Catholic missionaries had been working amongst New World peoples since the beginning of the sixteenth century, especially in Latin America. But the Jesuit Fathers sent to New France in 1625 undertook one of the "most ambitious missionary projects of the French era," and they recorded their thoughts on the objects of their proselytization.[575]

Home Board to Overseas Governor Thomas Thomas, 9 April 1814, H.B.C.A., PAM, A.6/18, pp.149-213.

[573] See Elizabeth Manche on early directions regarding overseas traders, Indians and trade goods. A Company of Businessmen, p.84.

[574] Ibid.

[575] John Webster Grant, Moon of Wintertime: Missionaries and the Indians of Canada in Encounter since 1534 (Toronto; Buffalo; London: University of Toronto Press, 1984), p.26.

Missionaries sent to Christianize the Indians of New France kept diaries in which their impressions of native life were recorded. Le Clercq and Sagard, Recollet missionaries, recorded some of their observations on North American natives, but the Jesuit journals contain some of the most comprehensive descriptions of native life written during the seventeenth century.[576] These journals were published as the Jesuit Relations, and their publication predated other travel literature by almost one hundred and fifty years. The Jesuit accounts were a testimony to both the success and the sacrifice associated with the conversion of "heathens" - a format intended to loosen French pocketbooks, and raise the money needed to support overseas missions.

The Jesuit Relations contained a wealth of anthropological information.[577] So did the published and unpublished journals written by later Roman Catholic and Protestant missionaries who lived amongst western Indians. Protestant missionaries were first sent to British North America in 1749, but none went to the northwest until the nineteenth century.[578] Anglican missionaries first arrived in Red River in 1820, and Wesleyan Methodists made their way

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[576] Ibid., p.31.

[577] See Bruce Trigger on the use of the Relations as a ethnographic source, especially "Introduction," The Children of Aataentsic: A History of the Huron People to 1660, Two vols. (Montreal: McGill-Queen's University Press, 1976).

[578] Ibid., p.71.

west in 1840. These Protestant missionaries, like the early Jesuits and the other New World Catholic missionaries; for example, the Sulpicians, the Recollets, the Sisters of Charity or the Grey Nuns and the Oblates, were unswerving in their belief that the natives could be Christianized.[579]

Roman Catholic missionaries were optimistic that natives could be both Christianized and civilized, and Protestant missionaries were confident that the "heathens" could be delivered from themselves through conversion. However, by 1850 critics of native-white relations were convinced of quite the opposite. It was now believed that the introduction of European culture and religion had been the beginning of the end for the native peoples of North America. Such convictions were fundamental to the emergence of anthropology as a social science in the nineteenth century. Both missionaries and early anthropologists acted out of a paternalistic desire to <u>help</u> "primitive" North Americans, but the assumptions underlying that benevolent impulse had changed. A belief that Indians were disappearing determined the focus of nineteenth century ethnology, and defined the parameters associated with the collections and preservation of socio-cultural "remnants."

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[579] J.W. Grant, <u>Moon of Wintertime</u>, p.75; V. Fast, "The Protestant Missionary and Fur Trade Society: Initial Contact in the Hudson's Bay Territory, 1820-1850," Ph.D., University of Manitoba, 1983; and, Martha McCarthy, "The Missions of the Oblates of Mary Immaculate to the Athapaskans, 1846-1870: Theory, Structure and Method," Ph.D. University of Manitoba, 1981.

This orientation was significantly different from the missionary ideals in which Christianity and civility were to be substituted for "heathenism." Research and reform were becoming increasingly secular, and nineteenth century anthropologists were certainly at the forefront of a movement which studied natives from a humanistic perspective.

Initially North American ethnologists and anthropologists focused on biological rather than on social or cultural issues, and the discovery of the origins of humanity preoccupied antebellum American scientists. Phrenologists and physical anthropologists such as Samuel George Morton, George Robin Gliddon, Louis Agassiz and Josiah Nott of the American school of anthropology all believed that the several "races" of mankind represented separate creations and separate species.[580] They also maintained that the correlation between race and species indicated a hierarchical arrangement corresponding to cultural attributes. The "coloured" or "primitive" races were at the bottom, and the more "civilized" or "white" races were at the top. Polygenists measured and compared anatomical, morphological and archaeological evidence in a manner quite

[580] Even Louis Agassiz, who had been a staunch monogenist before coming into physical contact with a Negro in the United States, leant his considerable prestige, and added the recapitulationist analogy and theory of plural creations, to the struggle to substantiate the doctrine of polygenesis that was advocated by the American School of Anthropology during the first half of the nineteenth century. William Stanton, The Leopard's Spots, p.103.

foreign to the monogenists who adhered to the Mosaic account, believed in the doctrine of psychic unity, and contended that morphological differences were due to environmental factors.

The resolution of the pre-Darwinian debate over the origins of species was probably more important to nineteenth century America than it was to most European nations. The American populace believed that the United States symbolized the triumph of democracy over plutocracy and the demise of social, political and economic elitism.[581] The Revolutionary Fathers had proclaimed equality as a constitutional right, but the reality of North American life was quite unlike the utopian vision described by political rhetoric. Numerous

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581 Until the mid-twentieth century most historical analyses agreed with nineteenth century assessments of their social, economic and political life. More recently historians have questioned this assumption and some, for example, Edward Pessen and Lee Benson, have employed quantitative methods to demonstrate that the rhetoric did not always depict the realities of life in nineteenth century America. See Edward Pessen, _Jacksonian America: Society, Personality and Politics_, (Homewood, Illinois: The Dorsey Press, 1969), for a general overview of the discrepancies between the myth and the reality of democracy in America, and see the following for topical analyses of these discrepancies: Lee Benson, _The Concept of Jacksonian Democracy: New York as a Test Case_ (Princeton University Press, 1961); Leon Litwack, _North of Slavery: The Negro in the Free States_ (University of Chicago Press, 1965); Henry Nash Smith, _Virgin Land: The West as Symbol and Myth_ (New York: Vintage Books, 1950); R. Takaki, _Iron Cages: Race and Culture in Nineteenth Century America_, (1980) Bernard Sheehan, _Seeds of Extinction: Jeffersonian Philanthrophy, and the American Indian_ (New York: W.W. Norton, 1974); Richard Slotkin, _Regeneration Through Violence: The Myth of the American Frontier_ (Wesleyan University Press, (1973); and, Mary E. Young, _Redskins, Ruffleshirts and Rednecks, Indian Allotments in Alabama_

inequalities existed. Elitism permeated financial and government circles, while illiteracy and the need to focus energies on the task of earning a living precluded active participation by common folk in federal, state or even local politics. The masses were ostensibly the foundation upon which democracy rested but popular participation was neither encouraged nor desired, and North American Indians and Negro bondsmen were deliberately and systematically excluded from participating in the political life of the newly created Republic. Indians and slaves were denied access to the democratic process. They were segregated from Anglo-American society by removal and through enslavement. The chasm that separated rhetoric and reality was responsible for the "reflexive" or introspective impulse behind anthropology.[582] Anthropological theories of cultural evolution were surfacing to explain the discrepancies between indigenous and imported cultures, simultaneously salving a national conscience by rationalizing the "inevitable" extinction of the "inferior races."

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and Mississippi, 1830-1860, (1961).

[582] Curtis Hinsley Jr., Scientists and Savages, p.8. See also George Stocking Jr., Victorian Anthropology, on ethnology as the "science of savages" and the comparative and evolutionary impulse behind ethnographic studies, specifically as it was precipitated by the Crystal Palace Exhibition, pp.xi-xvii. Also see William Stanton, The Leopard's Spots, pp.1-3 especially, in addition to Hinsley and Stocking on the reflexive nature of American anthropology.

But by mid-century ethnologists and anthropologists had largely abandoned debates over the biological origins of humanity in favour of studies of the relationship of "primitive" societies to the origins and development of "civilized" society. The effects of a rapid onslaught of a technically advanced culture, bringing infectious diseases as well as iron age weaponry, alcohol and the ideals of Manifest Destiny, were responsible for the decimation of post-contact native societies located within or near the settled regions of the United States and British North America. Those who cared could agree that, except in regions where interaction between natives and Europeans had been minimal, Indians were doomed. Reformists therefore advocated removal and segregation as the best hope for ameliorating the plight of natives as they travelled along the inexorable path to extinction, and the scientific community advocated the systematic collection and preservation of the material culture of a society whose future prospects were, they concurred, dismal.

American anthropologists such as George Gibbs and Lewis Henry Morgan lamented the decline of the Indian nations, but they were more interested in studying the very savagism and barbarism which had supposedly rendered native societies impotent. Nineteenth century evolutionists maintained that native societies were representative of the cultural origins of civilized society, and the temptation to analyze cultural origins was no less compelling than previous enquiries into ancestral origins. Descriptive ethnography could conceivably succeed where physical anthropology had failed. Moreover, anthropological collections would ensure, in the absence of living Amerindian societies, access to a heritage possibly denied future scholars. Collecting therefore became a priority of those people who were convinced that native societies would at best be assimilated, but would more probably be annihilated.

"Antiquities" and ethnographic "curiosities" could be found in European museums such as the Louvre, the Rijksmuseum voor Volkenkunde (Leiden), the British Museum[583] and the Peter the Great Museum of Anthropology and Ethnography in Leningrad.[584] But the specimens sent by northern traders and trappers to the Smithsonian Institution between 1859 and 1871 were amongst the first anthropological artifacts received by a North American scientific institution.[585] The Smithsonian had received a small number

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[583] William Ryan Chapman, "Arranging Ethnology, A.H.L.F. Pitt Rivers and the Typological Tradition," in Objects and Others, ed. G.W. Stocking Jr., pp.23-24.

[584] Erna V. Siebert, "Northern Athapaskan Collections of the First Half of the Nineteenth Century," Arctic Anthropology, 17-1(1980):49-60.

[585] Harvard University accepted an endowment to build a museum dedicated to archaeological and ethnological collections in 1866. The Peabody Museum of American Archaeology and Ethnology emerged at the same time as Smithsonian scientists were adding anthropological to their roster of scientific activities. See Curtis M. Hinsley, "From Shell-Heaps to Stelae, Early Anthropology at the Peabody Museum," in Objects and Others, ed. G.W. Stocking Jr., pp.49-74.

of anthropological specimens or Indian "curiosities" with the Patent Office specimens in 1857, but since archaeology and ethnology did not excite "widespread support in the world of science and scholarship" even as late as the 1860s, it is not surprising that the documentation regarding the origins and use of these early specimens was as inadequate as were the collections minuscule.[586] The Smithsonian Institution had received an "Indian Pillow," a "Blanket made of feathers by the natives of California," some "Wooden masks carved by the natives of the north west coast of America," and a few poorly identified technological and decorative items collected by expeditions sent west by the government.

Arctic artifacts were numerically significant as well as unprecedented. Anthropological specimens collected in the north arrived at the Smithsonian in far greater numbers than any previous donations. The Institution received hundreds of anthropological "peculiarities" that had been either collected, or constructed by northern traders and trappers. The Inuit collections were particularly comprehensive, but numerous specimens from the Chipewyan, Yellowknife, Kutchin, Dogrib, Slave, Loucheux, Hare, Nehanny and Fort Liards Indian tribes were also submitted. Everything from deerskin lodges to the medicine bones of a medicine man were shipped

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[586] See Hinsley, From Shell-Heaps to Stelae," pp.49-74 and, John C. Ewers, "A Century of American Indian Exhibits in the Smithsonian Institution," <u>SIAR</u>, 1958, pp.514-15.

to Washington.[587] The preference for articles of dress and technology is overwhelmingly apparent, and specimens of hunting apparatus were well represented in their collections. They submitted quivers, bows and arrows, snares, spears, darts and fishing line, tackle, hooks and nets. Bowmaking and carving tools as well as knives, saws, axes, hatchets, earth chisels, ice picks and scoops, needles, fire bags and fire drills were also sent. Baskets, buckets and boxes made of birch bark, grass and wood, as well as many articles of Indian and Inuit clothing were collected. Examples of summer and winter apparel worn by northern men, women and children were sent to the Smithsonian. Their moccasins, shoes and gloves, particularly if made from exotic furs or skins such as polar bear, seal or wolverine, accompanied the clothing. Collectors also sent the ceremonial headdress and clothing bestowed on a chief, as well as many other adornments. They sent copper bracelets and ornaments, purses and belts decorated with ivory, embroidery, quill or bead work, as well as ivory combs and wooden snow goggles.

These northern specimens were certainly part of Baird's dream to build the biggest, the best, and the first collection of all North American products. But increased anthropological accessions were not unrelated to the systematization of collecting procedures that had been

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[587] Registers, Accession Records, Anthropology Department, Smithsonian Institution, vols., I,II,III, SIA, RU 6990T, and Computer Printout, Ident. MNH4 122G113, MNH-ANN.

already introduced by Smithsonian scientists into the zoological sciences as early as 1850. In 1861, while Kennicott was still travelling through the north, the Smithsonian published directions in aid of anthropological collections. The "Instructions for Archaeological Investigations in the U. States" (1861) and the "Instructions for Research Relative to the Ethnology and Philology of America" (1863) were written by George Gibbs.[588] His guides were comprehensive, touching on most subjects deemed relevant by archaeologists and ethnologists. Moreover, they specifically attempted to rectify the deficiencies which had limited the specimens received from the Patent Office to non-scientific purposes.

The artifacts that had been collected by government expeditions had been carelessly and inadequately identified. They were usually submitted without indicating either tribal origins or their specific function.[589] Their utility was therefore reduced to researchers, and their applicability to museology restricted. They were little more than mere "novelties," and Gibbs' "Instructions" were aimed at rectifying the deplorable situation found amongst the Patent Office specimens by channelling collecting activities towards specific goals. Gibbs suggested that "In making

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[588] Gibbs eventually became the Smithsonian's first linguist, and he had developed an interest in native studies while a surveyor in the Washington Territories. Hinsley, Savages and Scientists, pp.51-56.

[589] John Ewers, "A Century of American Indian Exhibits in the Smithsonian Institution," pp.514-15.

these [anthropological] collections care should be taken to specify the tribes from whom they are obtained, and where any doubt may exist, the particular use to which each is applied."[590] His "Instructions" established standards analogous to those established by the field guides that had been written during the 1850s and 1860s by Baird, Brewer, LeConte, Clemens and Ostensacken, for zoological collecting, conservation and documentation. They combined the relatively new preoccupation with technological factors as indices of societal development with a lingering fascination in racial distinctiveness and the desire to preserve any and all of Amerindian material culture.[591]

Gibbs justified ethnology on both scientific and humanitarian grounds. He had a well enunciated moral imperative and a reform impulse behind his studies on North American Indians.[592] Gibbs' instructions were therefore unsurprisingly indicative of the "salvage ethos" that

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[590] SIAR, 1861, p.394.

[591] Hinsley states that Henry made a determined effort to disassociate the Smithsonian from physical anthropology (p.27-28), and while his efforts did not immediately reduce the demand for native crania, by the 1860s, skulls were viewed as a physiological corollary of the cultural differences associated with the historical development of "primitive" man. By the 1860s, polygenist endeavours to prove multiple creations through comparative craniology had been largely replaced by attempts to correlate "primitive" cultural attributes with physiological evidence.

[592] Hinsley, in fact, discusses the salvage ethos as personified by Gibbs. See, pp.21-22 and 51-52. See also Gibbs' "Instructions for Research Relative to the Ethnology and Philology of America," (Washington, D.C.: Smithsonian Institution, 1863), p.7.

permeated nineteenth century ethnology and which had been stated emphatically by the American artist, George Catlin, as early as 1841. Catlin's humanitarianism strongly shaped his opinion that descriptions of native culture were more important to future studies of Amerindians than the monogenist-polygenist debate over their origins:

> ...so abstruse [sic] a subject, [origins of North American Indians] and one so barren of positive proof, would require in its discussion too much circumstantial evidence for my allowed limits; which I am sure the world will agree will be filled up much more consistently with the avowed spirit of this work, [Letters and Notes in the Manners, Customs and Condition of the North American Indians] by treating of that which admits of an abundance of proof -- their actual existence, their customs -- and misfortunes; and the suggestions of modes for the amelioration of their condition.
>
> For a professed philanthropist, I should deem it cruel and hypocritical to waste time and space in the discussion of a subject, ever so interesting, (though unimportant), when the present condition and prospects of these people are calling so loudly upon the world for justice, and for mercy; and when their evanescent existence and customs are turning, as it were, on a wheel before us, but soon to be lost; whilst the mystery of their origin can as well be fathomed at a future day as now, and recorded with their exit.[593]

Catlin therefore anticipated Gibbs' argument in support of the expeditious and comprehensive collection of archaeological and ethnological specimens. But Gibbs facilitated the collection of native artifacts in a manner

[593] George Catlin, Letters and Notes on the Manners, Customs and Condition of the North American Indians, written during eight years' travel amongst the wildest tribes of Indians in North America, In 1832,33,34,35, 36,37,38 and 39, In two volumes (London: Tosswill & Myers, 1841), pp.229-230. [H.B.C.A., PAM, RB FTL YF 387.]

quite impossible for someone like Catlin who worked alone. Gibbs' "Instructions" were distributed widely to the field workers inducted within the Smithsonian collecting network. His "Instructions" informed volunteer collectors of anthropologists' needs, and directed their activities accordingly. His "Instructions" therefore contributed directly to the multiplication of data that was accumulated on North American natives after 1860.

Aboriginal cultures were viewed as pristine and unchanging, although primitive, and the "antiquities" obtained through archaeological excavations were valued additions to the Smithsonian collections. Gibbs' pamphlet reflected that appreciation, and a commitment to archaeology.[594] Archaeology allowed access to archaic technologies and Gibbs described the contents of shell beds, the human remains, the tools, weapons and implements that could depict the development of extinct societies. He accepted the division of Old World prehistory according to periods of stone, bronze and iron technology, and he pointed out that the relics and palaeontological specimens that were collected according to his "Instructions" would fall "naturally" within these three chronological periods.[595]

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[594] Hinsley states that these instructions were indicative of the interest in collecting Indian "antiquities," that was stimulated by Morlot's article, "General Views on Archaeology," SIAR, 1860. See Hinsley, p.41 and pp.51-54.

[595] "Instructions for Archaeological Investigation in the U. States," SIAR, 1861, p.394.

But Gibbs also proposed a supplementary periodization for North American prehistory. He integrated the westward diffusion of European culture within these technological divisions. Archaic society had already begun to disappear before the arrival of Europeans but contact had, according to Gibbs, compressed the last two stages of North American prehistory within a mere four hundred year period. Living aboriginal Americans therefore represented the final stage of prehistoric development.

Specimens of contemporary native culture were not truly archaic, but they were nevertheless desirable additions to the Smithsonian collections. Contact had allegedly accelerated the "inevitable" demise of stone and bronze age societies, and had supposedly transformed existing Amerindian societies irrevocably. The value of native artifacts was therefore enhanced by the belief that the opportunity to collect these articles was short-lived. It was believed that native societies were disappearing, or at the very least "exchanging their own manufactures for those of the white races," and Gibbs particularly suggested the collection of:

> ... dresses and ornaments, bowes and arrows, lances, war-clubs, knives, and weapons of all kinds, saddles with their furniture, models of lodges, parflesh packing covers and bags, cradles, mats, baskets of all sorts, gambling implements, models of canoes (as nearly as possible in their true proportions), paddles, fish-hooks and nets, fish-spears and gigs, pottery, pipes, the carvings in wood and stone of the Pacific coast Indians, and the wax and clay models of those of Mexico, tools used in dressing skins and in other

> manufactures, metates or stone mortars, &c., &c.[596]

The Smithsonian's anthropological "Instructions" and "Directions" had combined scientific necessity with curatorial acquisitiveness, but some artifacts were sent south long before Gibbs' pamphlets made their way north. Specimens collected before 1862 were sent in response to casual rather than formal requests, or because northerners had sent anthropological specimens to other institutions and had simply assumed that the Smithsonian would like similar specimens. George Wilson of the Royal Scottish Museum, for example, had solicited the support of northern traders in the formation of his anthropological collections, and HBC traders had already sent him specimens of Indian manufactures before Kennicott's arrival in 1859.[597] And although Kennicott was sent north in search of avian rather than anthropological specimens, he immediately recognized that if others were interested in northern Indian and "Esquiamaux peculiarities," the Smithsonian might also want to collect similar items: "Are Indian dresses and implements wanted? That is, I mean, shall I get any large number. ... I suppose for some museums such thing[s] would be desirable I'm getting a few things of the kind."[598] The Smithsonian

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[596] "Instructions for Archaeological Investigations in the U. States," p.394.

[597] Letter from George Wilson to B.R. Ross, 30 May 1859, SIA, Bernard Rogan Ross Notebook, RU 7221. Ross' Notebook also contains a list of the anthropological specimens he sent to Wilson in 1859.

was not to be outdone. Consequently, it received its first Inuit and Athapaskan specimens even before Gibbs' "Instructions" had been sent north.

Baird soon claimed, perhaps prematurely, that his northern anthropological collections were unequalled:

> It is believed that no such series is elsewhere to be found of the dresses, weapons, implements, utensils, instruments of war and of the chase, &c., &c., of the aborigines of Northern America.[599]

By the end of 1863 the Smithsonian had received 146 anthropological specimens from the north.[600] This was an inpressive contribution, but it represented only thirteen percent of the total collection received from HBC employees in over a decade of active collecting and the majority of northern anthropological specimens were submitted following the release of Gibbs' "Instructions."

By 1863 formalized directions were similarly applied to descriptive studies of "primitive man." Gibbs' second pamphlet contained an obvious bias in favour of observation or ethnography. It reflected his interest in historical linguistics, origins, migration routes, geographical distribution and cultural attributes. However the recording

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598 Letter from Kennicott to Baird, 17 Nov. 1859, SIA, RU 7213, Box 13.

599 SIAR, 1863, p.53.

600 This figure is based on the accession records of the Anthropology Department at the Smithsonian Institution. SIA, RU 6990T, and Computer Printout, Ident. MNH4 122G113, MNH-ANN.

of northern ethnographies was, like anthropological collecting generally, initiated somewhat earlier than might be expected from the Smithsonian publication schedule. Gibbs had contacted Bernard Rogan Ross regarding the preparation of a description of northern aborigines even before his second pamphlet was printed, and he had probably discussed the importance of ethnographic studies when he first met Ross while he was working as a geologist, botanist and naturalist on the North West Boundary Survey Commission in 1857.[601] It was expected that those who could provide information would do so dutifully.

Ross had already recorded some Indian vocabularies and had collected anthropological artifacts for Andrew Murray of Edinburgh, when he made Kennicott's acquaintance in 1859. Ross had, after all, abandoned ethnology in favour of ornithology largely as a result of Baird's influence. He considered himself inclined towards ethnology and meteorology in the spring of 1860, but a year later he was "... daily becoming more & more attached to the study in particular of ornithology -"[602]

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[601] Letter from Gibbs to J. Henry, 18 Nov. 1862, SIAR, pp.89-91. See also D. Lindsay, "The Hudson's Bay Company-Smithsonian Connection and Fur Trade Intellectual Life," p.595.

[602] See letters from Ross to Baird, 25 March 1860, SIA, HBC Corr Coll, Folder 41 and 18 March 1861, SIA, HBC Corr Coll, Folder 36.

When asked, however, Ross resumed his anthropological activities on behalf of the American institution. He accepted his "obligation" willingly. He agreed wholeheartedly with contemporary predictions of the imminent demise of an anachronistic way of life:

> Ethnology is but a modern science, and the former habits, customs, and traditions of many tribes are completely lost to the world: while even now the aboriginal races, brought into contact in almost every region with whites, Missionaries and pseudo or real civilization, have imperceptibly lost their ancient ideas, feelings and traditions, and notwithstanding their Asiatic tenacity, insensibly acquired the manners of the dominant race.[603]

Intellectually, Ross understood the tragedy faced by aboriginal Americans, but an essay that he wrote on the Dene betrayed the fact that he felt little remorse over the pending disappearance of native culture or society. His essay was published in the Smithsonian Institution Annual Report (1866), along with two other northern ethnographies. Strachan Jones described various elements of Kutchin socio-cultural organization, and William L. Hardisty wrote a similar essay on the Loucheux.[604] All three accounts were substantially subjective, but Hardisty and Jones were less patronizing and accusatory than Ross. Neither Ross nor Jones could resist offering their opinions on the physical

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[603] This is an excerpt from a manuscript draft of Ross' published article on the Dene. This section was cut from the version which appears in the Smithsonian Annual Report. Bernard Rogan Ross Notebook, SIA, RU 7221.

[604] SIAR, 1866, pp.301-327.

attractiveness of their subjects. Jones' comments were usually somewhat less critical than those made by Ross, and his contempt for the native population less obvious. Ross' attempts at objectivity were futile. He lorded his supposed superiority over what were often depicted as subjects barely deserving his consideration. And he never denied himself the pleasure of a deprecatory comment.

Scattered throughout Ross' account were statements which often started out innocently enough but, with the stroke of a pen, concluded with condemnation.[605] For example, in Ross' assessment of the physical attributes and fitness of the Dene people, he stated: "The prevailing complexion may, with propriety, be said to be of a dirty yellowish ochre tinge, ranging from a smoky brown to a tint as fair as that of many half-caste Europeans." "The Tinneh are far from a healthy race. The causes of death proceed rather from weakness of constitution and hereditary taint rather than from epidemic diseases, though, when the latter do come, they make great havoc." "Like all hunter tribes these people have the senses of sight and hearing in perfection, while, owing to the dirtiness of their habits, that of smell is greatly blunted." Ross also had much to say on Dene morality, most of it negative. For example: "Few of the moral faculties are possessed in any remarkable degree by the eastern Tinneh. They are tolerably honest, not bloodthirsty or cruel; but

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[605] The following quotations are, in order, from Ross' essay "The Eastern Tinneh," SIAR, 1868, pages 304, 305, 306, 307, 308 and 310.

this is, I suppose, the extent, as they are confirmed liars, far from being chaste," "As a whole the race under consideration is unwarlike. ... On examination of the subject closely, I am disposed to consider that this peaceful disposition proceeds more from timidity than from any actual disinclination to shed blood." "The instinct of love of offspring, common to the lower animals, exists strongly among these people, but considerably modified by the selfishness which is so conspicuous a feature in their character."

Jones was far less judgmental than Ross. He slavishly followed the format suggested by Gibbs, never demonstrating any inclination for embellishment nor exhibiting any literary aspirations. His reponses to Gibbs' queries were unimaginative. Jones put little effort into the construction of his narrative, focusing instead upon relaying all pertinent data. He seldom deviated from the format outlined in the Smithsonian "Instructions." Jones responded clearly, without hyperbole, to the topics identified by Gibbs. The following extract, for example, demonstrates the "facts" Gibbs viewed as necessary to describe "primitive" governments:

> Government- Is the tribe commanded by the same chief or chiefs in peace and in war, or by different ones? What is the extent of a chief's authority; and how does he acquire it, by birth or by the choice of the people? What are the insignia of his office, and what his privileges? Who are entitled to speak in the councils of the tribe? What laws have they; for instance, what are the punishments for theft, for adultery, for murder;

> and by whom are punishments inflicted?[606]

and Jones responded with clarity and conciseness:

> Government.- They are governed by the same chiefs in peace and in war. The authority of a chief is very limited, for the Indians are very unruly, and not at all disposed to submit to authority. The chiefs are chosen either on account of their wisdom or courage, and not at all on account of birth. They have no insignia of office, and as for privileges they have all that they can take, and none that the others can withold [sic] from them. The chiefs and old men are all who are entitled to speak in council, but any young man will not hesitate to get up and give his seniors the benefit of his wisdom.
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> Law.- They have no law or, rather, the injured party takes the law into his own hand. For theft, little or no punishment is inflicted; for adultery, the woman only is punished, being beaten and sometimes thrown off by her husband, and instances are not wanting of the woman being put to death; for murder, the friends or relations of the murdered man revenge his death; but if a medicine man is paid to kill him, and the man happens to die, the medicine man is innocent, and the one who paid him is the guilty one.[607]

Such an account would undoubtedly deter most recreational readers, but it does illustrate the format that emerged when the first generation of social scientists deliberately attempted to produce a more objective ethnography. The ethnography written by Jones was admittedly less entertaining than those written by Ross and Hardisty, but the economy and restraint found in Jones' style gave his account an air of objectivity which made his essay more compelling as a piece of scientific research.

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[606] "Instructions for Research Relative to the Ethnology and Philology of America," p.10.

[607] Strachan Jones, "The Kutchin Tribes," SIAR, 1866, p.325.

However, even the essays written by Ross and Hardisty tended to reflect the scientific recording procedures being developed at mid-century rather than conform to the literary conventions found in pre-ethnographic accounts. By the early twentieth century anthropologists had agreed that personal narratives, like those that had characterized the ethnographies found in travelogues or literature, should be excluded from scientific ethnographies.[608] Objective description rather than subjective narration had emerged as the preferred idiom of scholarly ethnography. Moreover, the authoritativeness or expertise of trained anthropologists was established on the basis of the comprehensiveness of their descriptions of unfamiliar, foreign or exotic cultures -- descriptions that were produced by a supposedly disinterested observer,[609] and the HBC ethnographies were written in response to one of the earliest attempts to objectify anthropology.

The differences in format found in the essays written by Ross, Hardisty and Jones were marginal rather than fundamental, and all three men followed Gibbs' "Instructions" fairly closely. There were, of course, minor

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608 Mary Louise Pratt, "Fieldwork in Common Places," in _Writing Culture: The Poetics and Politics of Ethnography_, eds., James Clifford and George E. Marcus, Experiments in Contemporary Anthropology, A School of American Research Advanced Seminar (Berkeley; Los Angeles; London: University of California Press, 1986), pp.27-50.

609 Pratt, Ibid., and Vincent Crapanzano, "Hermes' Dilemma: The Masking of Subversion in Ethnographic Description," in _Writing Culture_, p.53.

but interesting differences between their accounts. Ross was the most articulate, but he was also more opinionated and anecdotal than either Jones or Hardisty. Jones wrote the most "objective" description of native life, while Hardisty's essay was the most empathetic. Hardisty did not dwell on native physical characteristics or descriptions of how they satisfied physiological needs, but rather focused on their social and political relations, religious beliefs and language. Hardisty described the Loucheux as a "commercial people," barbarous but sociable, and having well established rules of conduct. He provided many English-Loucheux translations, particularly when repeating Loucheux legends. Derisive remarks surfaced occasionally, but his prose was remarkably free from value-laden terminology.

Ross, Hardisty and Jones were intimately familiar with the observed cultures. Each trader had lived in a northern outpost surrounded by natives for over a decade before writing their account. Their lives were interwoven with those of northern peoples. They were intimately familiar with native society and capable of responding comprehensively to the Smithsonian Circulars. Their essays, while biased, therefore provided invaluable information about nineteenth century native culture. They recorded information that was undoubtedly inaccessible to the occasional visitor. But their essays are important for another reason. They are indicative of the development of methodological assumptions, and of the development of an orientation specifically tied to the emerging social sciences.

Northern ethnographers were given criteria with which to judge societies, and the HBC collectors documented their observations on native societies in response to scientific rather than imperial, economic or religious reasons. They followed Gibbs' "Instructions," and his "Instructions" presented ethnographic documentation as a form of cultural preservation. Aboriginal life was to be examined, documented and when possible, conserved through collection, in order to reconstruct a "moving panorama of America in the older time."[610] Examinations of systems of trade, work habits, physical prowess and immorality were joined by broader based examinations of native economics, as well as by studies of social and political organization, law, war, customs, systems of measurement, the medical, industrial and communicative arts, methods of transportation, housing, sources of food, styles of clothing and general physiognomic descriptions. Tribal names, territorial boundaries and demographic estimates were also requested. Moreover, the procedures outlined by Gibbs represented one of the first deliberate steps taken by anthropologists to emanicipate their discipline from a reliance on the second hand and indiscriminate information thus far obtained from

[610] "Instructions for Research Relative to the Ethnology and Philology of America," p.7.

travellers, missionaries, colonial administrators and fur traders. For example, anthropologists such as Gibbs' colleague, Lewis H. Morgan, benefited from efforts made by northern collectors to satisfy scientific dictates, and although much of their information was admittedly still second hand, it was collected according to their criteria and with anthropological projects in mind.

Morgan and his British counterpart, Edward B. Tylor, were two of the most important anthropologists of the period. They were both evolutionists, and they were both interested in uncovering the origins of western "civilization." Since they believed that the origins of "civilized" society lay in a primitiveness similar to that found amongst the "coloured" peoples of the New Worlds,[611] information on indigenous peoples was indispensable to their work. And Morgan's analysis of kinship terminology, and ultimately his theory of cultural evolution, as represented through a delineation of stages or "ethnical periods" that were identified by family structure, technological complexity and notions of private property, actually benefited from the efforts of northern collectors.

MacFarlane received Morgan's "Circular in Reference to the degrees of Relationship among different nations,"[612] and

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[611] John Honigmann, <u>The Development of Anthropological Ideas</u>, Chapter 5, "Anthropology Becomes a Discipline," pp.111-191 and George Stocking Jr., <u>Victorian Anthropology</u>, pp.76-77.

[612] <u>SIAR</u>, Jan.1860 and again published in the Smithsonian

in 1863 he informed Baird that he had found evidence in support of Morgan's distinction between consanguinal and affinal relationships. He had allegedly discovered that the Indians living near Forts Liard and Good Hope possessed the Ganowanian, or the same kinship system as the Iroquoians examined by Morgan, but "for want of a good Interpreter" he could not supply similar linguistic data on the Loucheux and "Esquimaux."[613] However, W.L. Hardisty did manage to submit information on the Loucheux Indians.[614] Hardisty was much less sure of his contribution to Morgan's studies, but unlike MacFarlane he was specifically credited for the data that he supplied and that was used in the American anthropologist's kinship analysis.[615]

Scientific imperatives were not, of course, value free. But the HBC ethnographies represent more that the substitution of one form of subjectivity for another. By

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Miscellaneous Collections, II, 1862.

[613] Letter from MacFarlane to Baird, 6 May 1863, SIA, RU 7215, Box 14. See also Systems of Consanguinity and Affinity of the Human Family, Smithsonian Contributions to Knowledge, vol.17, 1871. (originally accepted for publication in 1868, see SIAR, 1868, p.450. or see, Ancient Society: Researches in the Lines of Human Progress from Savagery through Barbarism to Civilization (New York: H. Holt & Co., 1877).

[614] Letter from Hardisty to Kennicott, 30 Nov. 1864, SIA, HBC Corr Coll, Folder 22. Hardisty's contributions to Morgan's work can be found in Systems of Consanguinity and Affinity of the Human Family, Smithsonian Contributions to Knowledge, (218), vol.17 (1871), Anthropological Publications (Oosterhout, N.B., The Netherlands, 1970), pp.291-382.

[615] L.H. Morgan, Systems of Consanguinity and Affinity, p.289.

mid-century, ethnographic studies were increasingly undertaken for epistemological reasons. Overt economic and religious concerns had been subverted, as had the role of simple curiosity about "primitive man," to supposedly more important and justifiable reasons. And assessments of native societies had expanded to include many elements. The contents of the essays written by Ross, Jones and Hardisty consisted of information recorded in response to anthropological needs, just as the style of their essays reflected changing textual conventions.

Northern collectors had responded to demands for empirical verification of the nomothetic, as well as to the expropriatory tendencies of museums.[616] Collectors sent the Smithsonian examples of native technology because those were the specimens needed to test the hypothesis that the aboriginal inhabitants of North America represented an analogous phase of an earlier stage of European civilization. By 1860 North American scientists had accepted the tripartite delineation that European scientists had

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[616] See James Clifford, "Objects and Selves - An Afterword," in Objects and Others, ed., George Stocking Jr., pp.236-246, for a discussion of the psychological basis of the accumulative impulse underlying museum assessioning. He contends that museum collections reveal more about the cultural values of the collectors, than they reveal about the cultures subjected to study. The values of the dominant culture are expressed through their appropriation of another's culture, and as Stocking points out, Victorian society was fascinated with primitive technology because it illustrated the superiority of nineteenth century western technology. See Prologue, Victorian Anthropology (New York: The Free Press, 1987).

devised to explain the development of Old World prehistory, and examples of stone, bronze and iron manufactures were integral to the verification of a theory which associated societal development with technological advance.[617]

These same specimens became part of one of the earliest public anthropology collections. Northern artifacts were important components of early Smithsonian collections but because systematized, modern collection techniques preceded systematized, modern museum exhibits the data and specimens submitted by HBC collectors between 1859 and 1871 are less useful as measures of the development of museum anthropology, than they are as indices of the methodological and theoretical orientations of the new discipline.

The Smithsonian did not encourage anthropological collecting before the Civil War, but by the end of 1862, a year after the release of Gibbs' Circular, anthropological accessions had tripled.[618] They continued to increase from twenty-five to fifty percent over the next few years, and the 1870s decade was characterized by unprecedented anthropological accessions.[619] The anthropological artifacts

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[617] Hinsley, Savages and Scientists, p.41 and, Glyn Daniels, "One Hundred Years of Old World Prehistory," in One Hundred Years of Anthropology, ed., J.O. Brew (Cambridge: Harvard University Press, 1968), p.58.

[618] Hinsley, Savages and Scientists, p.66.

[619] Information on the anthropological accessions is found in the SIAR, 1861, p.64 1862, p.57; 1864, p.84; 1866, p.45; 1868, p.54; 1870, p.46; 1872, p.55; 1874, p.49; 1876, p.106; 1878, p.82, and 1880, p.139. There were 10,000 entries in 1870 and 45,570 entries in 1880.

that had been displayed at the Centennial Exposition held in Philadelphia in 1876 were removed to Washington and in 1879, when the Bureau of American Ethnology was established at the Smithsonian under Major John Wesley Powell, the Institution had "one of the most extensive North American collections in the world."[620]

But confusion and disarray characterized the Smithsonian anthropological collections even twenty years after the first specimens were deposited with the Institution. The anthropological collections were not even properly catalogued before 1876 when Dr. Charles Rau was hired to catalogue and organize the anthropological collections. The collections generally remained closed to the public until well after 1880 when George B. Goode and Otis T. Mason, employees of the newly created Department of Ethnology, were given the task of arranging them.[621] Mason was the Head of the Ethnology Department, and the first curator of the Division of Ethnology, which was created after the re-organization of the "ethnological division" in the early 1880s. Goode was made Head of the Department of Arts and Industries, and an Arts and Industries Building was

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Growth during this decade was undoubtedly due to westward expansion (Hinsley, p.68) but this is less likely to be the case during the 1860s when military personnel were occupied with the Civil War rather than with collecting.

620 Ewers, "A Century of American Indian Exhibits in the Smithsonian Institution," pp.516-17.

621 Hinsley, _Savages and Scientists_, p.68 and pp.91-93.

constructed as a result of the increased accessions and disciplinary specialization that occurred in the 1880s. Anthropological specimens were thereafter stored in the new building.

Expanded display facilities afforded Smithsonian ethnologists the opportunity to exhibit large numbers of the anthropological specimens that had been collected over the previous twenty years, but anthropological museology was in its infancy. Artifacts were grouped irrespective of cultural or geographic origins.[622] They were often arranged serially to illustrate increased technological complexity, thereby demonstrating the correlation between technological and cultural development that supposedly characterized the evolution from "primitive" to "civilized" society. Alternatively, artifacts were arranged simply to depict the many and varied forms of the same object.

Arctic technologies were no less important or less useful to the development of a distinctive branch of museology than the other anthropological specimens deposited at the Smithsonian in the years following the release of Gibbs' "Instructions," but they were collected almost twenty years before a permanent public display of anthropological artifacts was arranged. Display criteria were not therefore fundamental determinants of the composition of the northern

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[622] Ewers, "A Century of American Indian Exhibits in the Smithsonian Institution," p.518 and Hinsley, Savages and Scientists, pp.42-44, 74-75 and 92-94.

collections. But the artifacts collected in the sub-arctic nevertheless provide evidence that a significant step in the development of field work as a data collecting process had occurred during the 1860s. Requirements for new information and ever greater accuracy led to the development of new collection techniques, and Gibbs' "Instructions" introduced direction and control into the field almost fourteen years before the British Association for the Advancement of Science and the Anthropological Institute published Notes and Queries, as a means of rationalizing data collection.[623]

Gibbs' guidelines represent one of the earliest steps in the development of a standardized field orientation in the social sciences, and northern traders and trappers were no less a part of that dynamic process than were Gibbs and the other Smithsonian scientists. Northerners formed one of the earliest corps of collectors specifically instructed to collect cultural artifacts for scientific purposes. Their models, specimens and documentation were used in some of the first scientific analyses of "primitive" culture, and northern collectors consequently served two important functions in the development of the discipline of anthropology.

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[623] James Urry, "A history of field methods," in Ethnographic Research, A Guide to General Conduct, ed., R.F. Ellen, Research Methods in Social Anthropology, 1 (Academic Press, 1984), pp.35-61. Urry is an especially good source for information on the development of European fieldwork traditions. He devotes considerably less space to American developments, and he gives the Smithsonian initiatives relatively less space than they deserve.

Northern collectors provided some of the first useable and scientifically appropriate anthropological data, but their participation in a systematic and directed field program was an equally, if not more significant, contribution to the development of the social sciences in North America. Collections made by northern traders and trappers provided one of the first opportunities for the scientific community to assess the efficacy of field work as a scientific tool, and the parameters outlined by the Smithsonian collecting program mark the first, tentative steps made towards the development of a modern definition of anthropology.[624] Field investigations would soon be performed by trained anthropologists, and such investigations would become, in fact, the measure of an anthropologist's commitment and capabilities.[625] By adhering

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[624] Elman Service notes that the 1860s marked the emergence of modern investigations in anthropological inquiry. The topics that interested anthropologists such as Morgan, McLennan and Tylor have continued to intrigue anthropologists. Questions about kinship, social organization, political and economic life, as well as questions about society and culture generally have remained the focus of anthropological research. Moreover, anthropologists took theoretical stances that have persisted since the 1860s, for example, they adopted evolutionary ideas and examined them within a humanisitic framework. Elman R. Service, A Century of Controversy: Ethnological Issues from 1860 to 1960 (Orlando; San Diego; New York; London; Toronto; Montreal; Sydney; Tokyo: Academic Press Inc., 1985), p.3.

[625] Pertti J. Pelto, Anthropological Research: The Structure of Inquiry New York; Evanston; London: Harper & Row Pubs., 1970. See also Robert S. Anderson, "The Necessity of Field Methods in the Study of Scientific Research," in Sciences and Cultures, eds., Everett Mendelsohn and Yehuda Elkana, Sociology of the Sciences, Yearbook 1981 (Dordrecht, Holland; Boston; London: D.

to Gibbs' "Instructions," northern traders and trappers participated in early attempts to rationalize anthropological data collecting processes. Their efforts fell midway between those of the pre-ethnographers who collected data only sporadically for reasons often quite irrelevant to anthropological studies, and those of the professional or career anthropologist. They were informed rather than informing, directed rather than directive. But their activities and their motives differed markedly from their predecessors. The activities of HBC trader-collectors such as Ross, MacFarlane, Jones, Lockhart and Hardisty represented a liminal phase in the development of the discipline of anthropology, and their participation in the Smithsonian programs was indispensable to that development. For this reason, HBC collectors were welcomed by the scientific community that developed around the Smithsonian scientists.

Reidel Pub. Co., 1981), pp.213-44, for a slightly different application, but similar view of fieldwork within the sciences.

Chapter VIII

NEITHER HOBBYIST NOR SCIENTIST: STATUS, ROLE & COLLECTORS

Northern collectors not only sent south one of the largest natural history collections ever made in Rupert's Land; their efforts also enabled a select group of trader-collectors to obtain membership within the larger North American scientific community. The natural history and anthropological specimens sent by HBC collectors such as Roderick Ross MacFarlane, Bernard Rogan Ross, Donald Gunn, George Barnston, James Lockhart and Strachan Jones were as valuable as currency, and they were traded for prestige and status. These northern collectors, therefore, merit examination for their participation in a social relationship that was defined by scientific behaviour, as well as for their contributions to the theoretical, methodological and empirical bases of North American science.[626]

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[626] Analysis of the relationships between HBC collectors and the Smithsonian scientists is based on role theory as developed by anthropologists and sociologists. Ralph Linton pioneered work in role theory, and he defined the function of status and roles in social organization. See <u>The Study of Man</u> (New York: D. Appleton-Century, 1936); Anthropologists, Siegfried Nadel, <u>The Theory of Social Structure</u> (London: Cohen & West, 1957) and Ward Goodenough, "Rethinking 'Status' and 'Role': Towards a General Model of the Cultural Organization of Social Relationships," in <u>The Relevance of Models for Social Anthropology</u>, ed., Michael Banton, Association of Social Anthropologists Monographs 1 (1965) built upon Linton's

The status achieved by northern collectors was indicative of several factors. Skill, motivation, the knowledge and use of scientific concepts, the size and substance of their collections as well as authorship, influenced the status they achieved. MacFarlane, Ross, Barnston, Gunn, Lockhart and Jones were the most knowledgeable and sophisticated HBC collectors, and they were accorded status commensurate with their role in the acquisition of scientific data. Their scientific pursuits intermittently superseded vocational activities. These men truly became naturalists, even though their expertise and knowledge paled next to that possessed by career naturalists such as Kennicott and Baird. They were conversant with the debates and concepts of their period, and they developed great skill in the techniques of

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work. But role theory has also been adopted and developed by sociologists, most notably, Robert K. Merton. Merton's classic study of the sociology of science was first published in 1938: "Science, Technology, and Society in Seventeenth Century England," Osiris: Studies on the History and Philosophy of Science (Bruges, Belgium: St. Catherine's Press, 1938; with new preface, New York: Howard Fertig, 1970), but was followed by several other sociological studies. See especially, Merton, Social Theory and Social Structure (New York: Free Press, 1968), [earlier pub: 1949, 1957]; and "The Sociology of Science, An Episodic Memoir," in The Sociology of Science in Europe, eds., R.K. Merton and Jerry Gaston (Carbondale & Edwardsville: Southern Illinois University Press; London & Amsterdam: Feffer & Simons Ltd., 1977), pp.3-141; Bernard Barber, Science and the Social Order (New York: Free Press, 1952 and 1962 Second reprint, Westport, Conn.: Greenwood Press, 1978); J. Ben-David, The Scientist's Role in Society (Englewood Cliffs, N.J.: Prentice-Hall, 1971); Barry Barnes, ed., Sociology of Science: Selected Readings (Harmondsworth: Penguin Books, 1972); Evertt Mendelsohn, "Introduction," Science and Cultures, eds., E. Mendelsohn and Yehuda Elkana, Sociology of the Sciences, Yearbook 1981 (Dordrecht, Holland; Boston; London: D. Reidel Pub. Co., 1981), pp.vii-xiii. For more specific collection, preservation and identification of natural history specimens. The quality and quantity of their collections were substantial. They were all published authors, and they generally used scientific nomenclature in their morphological descriptions of mammalian and ornithological specimens.

The bulk of northern collectors did not, however, share the aspirations of men like MacFarlane, Ross, Lockhart, Jones, Gunn or Barnston. Nor did they understand why their efforts were important to science. There were two groups of relatively uneducated and unsophisticated collectors who had little appreciation of the importance of their specimens. Collectors such as William Brass, John Dunlop, Andrew and James Flett, Julian Onion, John Reid, Nicol Taylor and Andrew Mackenzie genuinely believed that their contributions would in some way advance science, but they exhibited little appreciation as to how these specimens accomplished that feat. Nor did these employees have any vision of improving their social status through science. Consequently they collected for the Smithsonian only briefly. They were hobbyists. But since collecting on a grand scale had relatively little recreational value, these men soon

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discussions on status and role in the scientific community see, W.O. Hagstrom, The Scientific Community (New York: Basic Books, 1965) and "Gift-giving as an Organizing Principle in Science," in Sociology of Science: Selected Readings, ed., Barry Barnes (Harmondsworth: Penguin Books, 1972), and Jerry Gaston, The Reward System in British and American Science (Toronto: John Willey & Sons, 1978).

abandoned science.

The more reliable corps of uneducated participants therefore consisted of indigenous native collectors. Inuit, Indian and mixed-bloods formed the labour force needed to amass the collections submitted to the Smithsonian. Specimens were purchased from the native community, and indigenous collectors were consulted regularly about the geographical distribution and migratory patterns of northern animals. They were often called upon to identify and correlate oological and ornithological specimens, and many native collectors showed sufficient aptitude and interest that they were instructed in the techniques of skinning, stuffing and packing. They supplied most of the brawn, and provided information on zoological specimens that was common knowledge to local inhabitants, but was beyond the reach of visiting naturalists as well as many fur traders. They possessed or developed, in essence, the skills necessary for the systematic collection of zoological specimens and anthropological artifacts.

Natural history collections were therefore made by a two-step process, and collectors at both levels were rewarded for their efforts. The collection, preservation and packing of specimens were generally relegated to the less educated, but nevertheless able collectors, who would trade their time and skills for money or goods. However the documentation, measurement and identification that was to accompany these specimens fell under the purview of the more educated and supposedly altruistic traders. These traders donated their specimens and their time to scientists who would appreciate the value of their efforts, and who would reward them appropriately. Trinkets, American manufactures, scientific apparatus, books, tobacco and alcohol were sent to northern collectors, native, mixed-bloods and "whites," but the allocation of extra-economic rewards varied in relation to the labour process. The small group of educated collectors, who participated at both levels of the local labour hierarchy, worked for more than the luxuries offered them by Baird. They wanted the recognition and prestige that was their due as persons who had made valuable contributions to science.

Such desires rested ultimately with individual perceptions of the role of collectors and scientists, and with the adoption of the scientific ethos by the more educated collectors. Science could be incorporated most easily within a cognitive framework based on western European traditions and since MacFarlane, Ross, Jones, Lockhart, Gunn and Barnston had a European cultural orientation they could, and did, conform most readily to scientific norms. They all professed a disinterestedness in self-aggrandizement, believing that their contributions were advancing the "cause of science." They undoubtedly took up science as a recreational pursuit, but this motivation was soon superseded by more serious considerations. Social status could be enhanced through recognition for scientific activities, and they quickly eschewed the economic or recreational imperatives that motivated many northern collectors. Ross, MacFarlane, Jones and Lockhart were status-poor within the fur trade community, and so they willingly fitted themselves into a system wherein data was exchanged for prestige, peer recognition and social status.

And these trader-collectors were not disappointed in their efforts to fit into a new social network. They received both institutionalized and interpersonal recognition within the scientific community.[627] Their contributions were recognized formally through publication, through acknowledgements in scientific works such as Baird's History of North American Birds, his Water Birds of North America, and Elliott Coues' Key to North American Birds, as well as through membership in learned societies. Moreover, their efforts were repaid with many other gifts that had no monetary equivalent. Baird's friendship and his willingness to sponsor HBC collectors for membership within scientific societies, as well as his encouragement and praise were often far more gratifying than trading specimens for specie.

[627] W.O. Hagstrom describes the types of rewards and forms of social control used by the scientific community to nurture its members. The Scientific Community (New York: Basic Books, 1965), pp.12-43.

The immediacy of tangible remuneration was an undeniably important incentive for many collectors. But Ross, MacFarlane, Barnston, Gunn, Jones and Lockhart were generally motivated by non-economic factors. They reveled in their new found roles. Baird and Kennicott treated them as equals. They were not relegated to the position of inferiority and submissiveness to which their native "assistants" had been assigned, but were cast in new roles as collectors. They were allowed access to a whole new community, and given status within that community. Their specimens were welcome additions to the Smithsonian collections, and they were welcome guests in the homes of the Smithsonian scientists. They had integrated science within their daily activities, and they were rewarded by membership within a largely inaccessible and exclusive social structure. For Ross, MacFarlane, Barnston, Gunn, Jones and Lockhart field work truly became a labour of love, because collecting allowed them access to a community that transcended local, regional and even continental boundaries. Internationalism was an integral component of the scientific ethos, and scientists such as Joseph Henry maintained that the fruits of their labours belonged to mankind, not the nation.[628] The same maxim applied, in principle, to the contributions made by fieldworkers.

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[628] Henry articulated this view from the beginning of his association with the Smithsonian. See, his "Programme of Organization," 8 Dec. 1847, printed in Smithsonian Miscellaneous Collections, ed., W.J. Rhees, vol.17, 1879, p.944.

Scientific activities propelled these HBC collectors into an elevated but ill-defined social position. Their activities meant that they were an atypical group within North American society, but their membership in the scientific community was limited by their function as collectors.[629] The real scientists such as Joseph Henry knew the intellectual and social limits of field workers. They were capable of collecting data, but unable to perform the more theoretical and synthetic tasks necessary to analyze raw data.[630] Collectors like Ross, MacFarlane, Lockhart, Jones, Gunn and Barnston therefore achieved only marginal membership within the Smithsonian scientific community.

Science and the community of savants associated with scientific activities were not entirely unknown to the HBC traders who collected on behalf of the Smithsonian Institution. Ross and Gunn had been contacted previously by scientific societies and museums, and they had even submitted data and specimens on occasion. George Barnston was, however, particularly well versed in the sciences long before meeting Kennicott in 1859. He was a member of the

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[629] Sally Gregory Kohlstedt's analysis of the American scientific community, as exemplified by the American Association for the Advancement of Science, shows that only 6% of the total population participated actively in scientific activities at mid-century. The Formation of the American Scientific Community: The American Association for the Advancement of Science, 1848-60 (University of Illinois Press, 1976), p.232ff.

[630] Hinsley, Savages and Scientists, p.38.

Montreal Natural History Society, and had presented a paper at the inaugural meeting of the Botanical Society of Montreal.[631] He also had several articles[632] published in the Canadian Naturalist and Geologist.

Barnston was, in fact, the only HBC trader-collector who had made a significant contribution to science in the nineteenth century prior to his connections with the Smithsonian. Barnston's scientific activities began in the 1820s after he met the botanist David Douglas, and they spanned half a century. He was an avid botanist, adding zoology and microscopy to his repertoire after 1859.[633] His reputation was confirmed rather than created by the Smithsonian connection. Barnston was too much the patriot to

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631 Zeller, Inventing Canada, p.221.

632 Barnston had four articles published by 1859 and had an additional five articles published between 1860 and 1875 in the Canadian Naturalist and Geologist (or in the Canadian Naturalist and Quarterly Journal as it was called after 1869): "Remarks upon the Geographical Distribution of the Order Ranunculaceae, throughout the British possessions of North America," vol.2, 1857, pp.12-20; "Remarks on the Geographical Distribution of Plants in the British possessions of North America," vol.3, 1858, pp.26-32; "Remarks on the Geographical Distribution of the Cruciferae, throughout the British possessions in North America," vol.4, 1859, pp.1-12; "Geographical Distribution of the Genus Allium in British North America," vol.4, 1859, pp.116-121 "Abridged sketch of the life of Mr. David Douglas, Botanist, with a few details of his travels and discoveries," vol.5, 1860, pp.120-132 and 267-278; "Recollections of the Swans and Geese of Hudson's Bay," vol.6, 1861, pp.337-44; "Remarks on the Genus Lutra, and on the species inhabiting North America," vol.8, 1863, and "On a collection of Plants from British Columbia made by Mr. James Richardson, in the summer of 1874," vol.8, 1875, pp.90-94.

have ever established himself within the Republican scientific community.[634] Eight of Barnston's articles were published in the Canadian Naturalist and Geologist and at least one article appeared in the British Ornithological Journal Ibis, but not one word written by Barnston was ever printed by the Smithsonian press.[635] Barnston's contributions also differed from those of his northern colleagues because they were made largely through the forum established by the philosophical and scientific societies. He did donate an entomological collection to the British Museum,[636] but by and large his sympathies lay with the British and Canadian socities. In this respect he differed markedly from the more productive Mackenzie River collectors.

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[633] Letter from Barnston to Baird, 26 Jan. 1860, HBC Corr Coll, Folder 2.

[634] Evidence of Barnston's sympathies is found in his letters to Baird in which he discusses his British, particularly Scottish, and Canadian symapathies. See especially a letter dated 26 Jan. 1860, SIA, HBC Corr Coll, Folder 2 and another, an undated letter fragment written in 1859-60, in which he stated his hopes that the British government would find the money to print the data accumulated by Captain Palliser while in the northwest. He hoped that the British government would view these as having "National Interests," rather than as simply the observations of a "hobbyist." Moreover, Barnston felt obliged to support the Montreal Natural History Society and McGill College over the Smithsonian, since the American institution had specimens to "superfuity." [sic] Letter from Barnston to Baird, 20 July 1861, SIA, HBC Corr Coll, Folder 2.

[635] See Brown and Van Kirk for a synopsis of Barnston's more important publications, particularly the reference to his article in Ibis. "George Barnston," DCB, vol.11, p.53.

[636] Ibid.

Ross and MacFarlane's reputations were made through the Smithsonian. Subsequent accomplishments, including memberships in scientific and philosophical societies, complemented their stature as collectors. Their relationship with the Smithsonian initiated, rather than culminated, careers as field naturalists and ethnographers. Their activities were generally channelled through the Smithsonian, and the Smithsonian had a well articulated and generally cohesive program, an efficient administration, and the personnel and funds needed to process specimens. MacFarlane and Ross therefore functioned within a context that differed significantly from that created by the loosely organized philosophical and scientific societies with which Barnston was familiar.

The capacity of the Smithsonian system to cope with specimens far exceeded that of the learned societies, and the size and composition of the collections sent by Ross and MacFarlane undoubtedly reflect the effects of the institutionalization of science that occurred at mid-century, as much as they reflect their individual predispositions.[637] Nevertheless, Ross' acquaintance with

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[637] Institutionalization was, according to George Daniels, a necessary step in the the process of professionalization in the sciences. This step functioned to regularize the relationships between scientists, and between scientists and the general public. See Daniels, "The Process of Professionalism in American Science: The Emergent Period, 1820-60," in Science in America Since 1820, ed., Nathan Reingold, (1976). Robert Bruce corroborates Daniels thesis substantively by examining the institutionalization of science and technology that occurred between 1846 and 1876, when modern

Kennicott initiated an extremely productive period in which he submitted approximately twenty percent of the total number of specimens sent south between 1859 and 1871. His efforts received recognition annually in the Smithsonian Annual Report, and he also received special mention in Baird's monographs on the Land and Water Birds that were published in 1874 and 1884.[638] Ross was also an undisputed success in terms of publications.[639] He had six articles published in the Canadian Naturalist and Geologist, one in the Natural History Review (London), and one in the Smithsonian Institution Annual Report. Ross published fewer articles than his colleague Barnston, but the fact that more than one publisher was interested in printing his data increased his chances of recognition within the scientific

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organizational patterns were established in America. See The Launching of Modern American Science, (1987). Both Daniels and Bruce perceive the Civil War as a watershed in the institutionalizing process because the War allowed scientists to assert themselves in policy formulation. See especially Daniels, Science in American Society: A Social History, (1971), pp.267-69.

[638] See Appendix 8 for an accounting of the specimens and notes submitted by HBC collectors, and used by Baird in the compilation of these volumes.

[639] Ross' publications include the following articles in the Canadian Naturalist and Geologist: "On the Indian Tribes of McKenzie River District and the Arctic Coast," vol.4, 1859, pp.190-95; "A Popular Treatise on the Fur-bearing Animals of the Mackenzie River District," vol.6, 1861, pp.5-36; "An Account of the Animals useful in an economic point of view to the various Chipewyan Tribes," vol.6, pp.433-41; "List of Species of Mammals and Birds - collected in McKenzie's River District during 1860-61," vol.6, pp.441-44; "An account of the Botanical and Mineral products, useful to the Chipewyan tribes of Indians, inhabiting the Mackenzie River District," vol.7, 1862, pp.133-37; "List of Mammals, Birds, and Eggs, observed in the McKenzie's River District, with

community. Diversity was at least as important a criterion as quantity in acquiring status through publication and Ross' publication record would have certainly facilitated his acceptance within the scientific community. It might have even compensated for his failure to become a Chief Factor considering that:

> ... the acceptance by scientific journals of contributed manuscripts establishes the donor's status as a scientist - indeed, status as a scientist can be achieved only by such gift-giving - and it assures him of prestige within the scientific community.[640]

Ross also recognized the role played by formal membership within the scientific community in the allocation of prestige, and he did not hesitate to ask Baird for his assistance in meeting the requirements for such membership:

> I am preparing an article on the Anatrace [?] found in this District for the Academy of Sciences, as I do not wish to be a silent member - I enclose it to you, and would feel very much obliged if you would look over it first and then forward it with the accompanying letter to Philadelphia.[641]

Notices," vol.7, pp.137-155. Ross also had an article published in the Natural History Review entitled "On the Mammals, Birds, etc., of the Mackenzie River District," vol.2 (second series), pp.269-90 and one published in the Smithsonian Institution Annual Report entitled "The Eastern Tinneh or Chepewyan (Indians)," 1866, pp.304-311.

640 W.O. Hagstrom, "Gift-giving as an Organizing Principle in Science," in Sociology of Science: Selected Readings, ed., Barry Barnes (Penguin Books, 1972), p.106.

641 Letter from Ross to Baird, 1 June 1862, SIA, HBC Corr Coll, Folder 36.

In total Ross belonged to five scientific and philosophical societies, including the Hall of the Academy of Natural Sciences of Philadelphia. He also belonged to the Natural History Society of Montreal, the York Historical Society, the London Royal Geographical Society and the Anthropological Society of London.[642]

Ross had the misfortune, however, of being disliked by almost everyone who knew him. He had an inordinate amount of self-esteem and even Kennicott, who seldom expressed a negative opinion about any of the collectors that he had recruited, could barely tolerate Ross' company. He wrote to Baird descibing his efforts to solicit Ross' assistance, and indicated that Ross' help was only obtained at great personal sacrifice. Kennicott often had to endure both pomposity and oratory.[643] Kennicott only remained civil to Ross through great self-control, particularly after learning that Ross had duped him into thinking that the HBC collections were procured through his personal generosity:

> I learned from [Laurence] Clarke that far from his letting me go free being a favour Mr Ross had no right to charge me anyway as no men were sent on my account. Clarke opened my eyes to the fact of my having been humbugged by Mr Ross in this and other respects mentioned - I found too that he had given me the meanest kind of a voyaging allowance. Clarke was expressively enraged & would make a row

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642 D. Lindsay, "The Hudson's Bay Company - Smithsonian Connection," p.609.

643 There are numerous references to Ross' character, and to Kennicott's dealings with him, but see the following letters from Kennicott to Baird especially: 29 June 1860, 8 July 1861 and 21 Jan. 1862, SIA, RU 7215, Box 13.

> about it if I'd let him - So it seems that Gov Simpson was not forgetting me at all or meaning that I was to live on the gentlemans allowance at whose post I stopped - I am of course hurt that Mr Ross should have treated me so meanly - the more so as he was always recurring [referring?] in my presence to the fact, or rather his statement, that his allowance was short - I in my innocence supposing he was entitled to this large amount which I knew he must have kept. -
>
> You may suppose that after this I shall not think as kindly of some of Mr Ross' disagreeable doings but Ill just keep my opinion to myself and play the hypocrite a little - I shall not get into any row with him under any circumstances and have made Hardisty & Clarke agree to say nothing of his treatment of me respecting allowances etc - I wish I hadnt begun writing about him but as I did begin I've given you an idea of the thing lest you should think I had gotten into some row with him or would be foolish enough to do so, - He doesnt like me more than moderately well but I shall manage to keep him thinking I consider him grand chose - The end sanctions the means the Catholic priest here says.[644]

Ross was one of the most self-indulgent persons that Kennicott was to meet in his brief stay in the Mackenzie River District. Ross never hid his desire for fame and glory as a scientist, and he did indeed make a name for himself in science. He took every opportunity to affix his name to northern collections, even robbing others of recognition.[645] There were numerous complaints that Ross had taken credit for specimens collected by others, and Kennicott quickly recommended that Baird make a special

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[644] Letter from Kennicott to Baird, 29 June 1860, SIA, RU 7215, Box 13.

[645] See letter from Reid to Baird, 8 Dec. 1863 and 6 Dec. 1864, SIA, HBC Corr Coll, Folder 35. See also letters from Kennicott to Baird, 1 Sept. 1860, 23 July 1861 and 21 Jan. 1862, SIA, RU 7215, Box 13.

effort to encourage those who had been put off collecting by Ross' greediness:

> I dont know if I ever explained fully that as I found Mr Ross very anxious to send all he could in his own name I agreed that I would teach all I could to Reed and some of the other Postmasters and clerks who were to hand over to him all the specimens to be sent out in his or his & the collectors names - As I of course wanted to see all the specimens sent possible - I thought this [a] better policy than to have them given to me. The more so as Mr Ross rather insisted on it & agreed to pay any expense. But I find almost all the gentlemen opposed to this, all Ive seen since preferring to give the specimens directly. Clarke says he'll see him d__d first & me too! As he says Mr R. "is too fond of getting others to work and he getting the credit" So I'm afraid we'll not make the thing work - But Ill try to keep Mr Ross satisfied and hope he will himself collect a good deal - I shall try to get all the gentlemen to send specimens direct to the S.I. - that is such as will not send them thro' Mr Ross. And I think it would be highly advisable under the circumstances for you to write directly to such as send out specimens this spring - Any way to Mr Hardisty Esq Ft Resolution Slave Lake, Mr Laurence Clarke Ft Rae and Mr Alex McKenzie Ft Liard.[646]

Ross did have one redeeming feature. He got the job done. Numerous specimens found their way to the Smithsonian because of Ross' insatiable desire for attention. But Ross' contribution, despite his duplicity, thievishness, and rapaciousness, was easily outdone by that made by Roderick Ross MacFarlane. MacFarlane was a <u>mere</u> clerk with the HBC, but he sent the Smithsonian more than double the number of specimens sent by Ross, contributing almost fifty percent of the specimens sent out by the HBC collectors.

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[646] Letter from Kennicott to Baird, 29 June 1860, SIA, RU 7215, Box 13.

MacFarlane, like Ross, was a published author. He co-authored a monograph entitled Through the Mackenzie Basin with Charles Mair,[647] and wrote an account of his explorations on the Anderson River that was published in The Canadian Record of Science. He wrote a pamphlet on North American mammals for the United States National Museum, and an article on northern ornithology for the Historical and Scientific Society of Manitoba.[648] His assistance was acknowledged more frequently in Baird's monographs on Land and Water Birds, than that of any other North American contributor.

Kennicott also expressed his gratitude for MacFarlane's efforts. His praise became quite lavish at times, placing more importance on scientific achievements than on the contributions made by politicians and corporate managers:

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[647] A Narrative of the Athabasca and Peace River Treaty Expedition of 1899, Notes on the Mammals and Birds of Northern Canada, by MacFarlane, (1908).

[648] MacFarlane's articles on mammals and birds were both reprinted. All references are given here. "On an Expedition down the Begh-ula or Anderson River," The Canadian Record of Science, vol.4, Jan. 1890, pp.28-53 "Land and Sea Birds nesting within the Arctic Circle in the Lower Mackenzie District," The Historical and Scientific Society of Manitoba, Transactions, 39, 1890; "Notes on and List of Birds and Eggs collected in Arctic America, 1861-1866" [Reprint of article published by the Historical and Scientific Society of Manitoba], Proceedings of the United States National Museum, vol.14, 1891, pp.413-466; "Notes on Mammals collected and observed in the northern Mackenzie River District, North-West Territories of Canada, with Remarks on Explorers and Explorations of the Far North," Proceedings of the United States National Museum, vol.28, 1905, pp.673-764.

> Upon my honor McFarlane I would rather have had the honor of contributing what you and Lockhart have to the history of Arctic zoology than to be a Chief Factor in the H.B.Co or a member of Parliament - The latter would be jolly during life but in the former case my name would be immortal among naturalists.[649]

MacFarlane was, however, reluctant to accept such accolades:

> Should your own and Professor Baird's future letters to me prove as flattering as those I have been accustomed to receive of late, I really must believe, what I have not hitherto done, that I am doing something in the way of advancing the interests of Science - however, as I myself experience much pleasure in collecting objects of Natural History, I shall continue the occupation, equally regardless of praise as of censure. As for writing anything for publication - I'll know more of the subject than I do now, ere Ive persuaded to attempt anything of the kind; as to the brief notes accompanying the specimens I care not what use may be made of them, as they are, I think, correct in the little they say. But enough of this for the present.[650]

Such disinterestedness does not, however, mean that the recognition received by MacFarlane was unappreciated or unwanted. By offering his data, no strings attached, he established a series of obligations based on "gift-giving." MacFarlane offered specimens to the Smithsonian in the same spirit as internationally renowned scientists offered their discoveries to their colleagues:

> ... [the] expectation of return gifts (of recognition) cannot be publicly acknowledged as a motive for making the gift. A gift is supposed to be given, not in the expectation of a return, but as an expression of the sentiment of the donor towards the recipient. [and] The public disavowal

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649 Letter from Kennicott to MacFarlane, 15 April 1864, SIA, RU 7215, Box 13.

650 Letter from MacFarlane to Kennicott, 9 Sept. 1864, SIA, RU 7215, Box 14.

> of the expectation of recognition in return for scientific contributions should not be taken to mean that the expectation is absent.[651]

There is no doubt that publication and membership in learned societies were important indices of success within the scientific community. Jones, Lockhart and Gunn also shared in the distinction of having articles published by the Smithsonian press, although Lockhart and Jones only managed one article each, and Gunn had one very short piece and a regular length article printed in the Annual Report of the Smithsonian Institution.[652] But it is quite conceivable and even probable that, except for Ross who had an extraordinarily high opinion of his capabilities, HBC collectors derived at least as much satisfaction from their personal relationships with Kennicott and Baird, as they did from the more formal avenues of recognition.

The personal dimension given science through Kennicott's presence played an enormous role in the initial recruitment of collectors. Some seventeen "Europeans" collected for the Smithsonian in 1860. This was the first full year that Kennicott spent travelling throughout the Mackenzie River

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[651] Hagstrom, "Gift-giving as an Organizing Principle in Science," pp.106 and 107.

[652] Gunn, "Indian remains near Red River settlement, Hudson's Bay Territories," SIAR, 1867: 399-400; "An egging exploration to Shoal Lake," SIAR, 1867: 427-32. S. Jones, "The Kutchin (Indian) Tribes," SIAR, 1866: 320-27, and J. Lockhart, "Notes on the Habits of the Moose in the Far North of British America in 1865," Proceedings of the United States National Museum, vol.13, 1890, pp.305-308.

District, and the majority of specimens collected in the sub-arctic were sent south during the four years that Kennicott lived in the north and in the two years contiguous to his visit.[653] Laurence Clarke, easily one of the most peripatetic collectors of the group, attests to Kennicott's influence in motivating him to collect:

> A further acquaintance with Mr Kennicott, who's zeal in the pursuit of science cannot be too much applauded, admiration for his many estimable qualities, regard for his amiable character, and a consequent wish to aid him in furthering the objects of his journey to the far North, made me this year take a more lively interest in gathering for your Institution, ...[654]

MacFarlane and Lockhart formed fast friendships with Kennicott, but all of the most productive collectors developed more or less friendly relationships with Kennicott personally, and with Baird through their correspondence. Ross, Lockhart and Jones even visited him in Washington.[655] They bunked in the spare rooms at the Smithsonian where Henry and his family lived, and met Kennicott's naturalist friends - the "illustrious" members of the Megatherium Club - William Stimpson, Carabus Ulke, Baron Ostensacken and numerous others.[656]

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[653] See Table 5.1, p. 174.

[654] Letter from Clarke to Baird, 21 June 1861, SIA, HBC Corr Coll, Folder 9.

[655] See following correspondence for references to their visits: Letters from Kennicott to Baird; 26 March, 28 March, 31 March 1863, SIA, RU 7002, Box 27: letters from Jones to Baird, 1 Dec. 1866 and 15 April 1867, SIA, HBC Corr Coll, Folder 24: letters from Lockhart to Baird, 17 Dec. 1866, SIA, HBC Corr Coll, Folder 26; MacFarlane to Baird, 27 Nov. 1866, SIA, RU 7215, Box 14.

The HBC-Smithsonian relationship found common ground in the desire to reap the benefits accruing from comprehensive Arctic collections, and this relationship was ultimately fundamental to the process of socializing the uninitiated:

> While institutionalized forms of recognition are most important in maintaining conformity to higher scientific norms, the elementary forms [informal contacts and interpersonal relationships] mediate between the larger scientific community and the individual scientist.[657]

The Smithsonian Institution was perpetually indebted to these northern collectors, but in the capable hands of Baird and Kennicott this was a debt that could be used to advantage. Payment for past efforts obliged collectors to press on. They were consequently drawn, admittedly often quite willingly, into the web of reciprocity by which the scientific community, and the poorly endowed Smithsonian in particular, functioned.[658]

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[656] The Megatherium was the name of the extinct giant sloth of South America and S. Cannon, in fact, exemplifies the "poetic popularization" that occurred in science in the nineteenth century with this very term. Science in Culture, p.5. Kennicott refers to the "real" Megatheria in one of his letters to Baird and includes amongst this group a Mr. Uhler, Ulke, Ostensacken and the "shell men." This last group would have included naturalists such as Stimpson, Ordway, Verrill, C.P. Carpenter, Lea, Binney, Bush and probably LeConte, Loew, Hagen Edwards and Morris. See letter from Kennicott to Baird, 29 June 1860, SIA, RU 7215, Box 13 and see SIAR, 1862, p.62 for identification of naturalists working at the Institution.

[657] Hagstrom, The Scientific Community, pp.35-36.

[658] W.A. Deiss has described Baird's reward system in "Spencer F. Baird and his collectors," J. Soc. Biblphy nat. Hist.(1980)9(4): 635-645.

Baird never begrudged his collectors any "favour" that was within his power to bestow, and he exchanged these "favours" gladly in recognition of past efforts, as well as in anticipation of future endeavours. Baird purchased books, newpapers, tobacco, harmonicas, rifles and ammunition on behalf of his collectors. Over the six year period of most active collecting he also sent many gallons of whiskey, or what was euphemistically referred to as "medicine for exiles," that "elevating substance" and the "element of conduction" to his collectors. Alcohol was illegal in the Mackenzie River District, but Baird was willing to transgress the law on behalf of his collectors and his beloved Institution. He managed to send "good whiskey" north by disguising it as denatured alcohol. Whiskey was shipped in containers soaked in kreosote so as to deceive Company officials into believing that it was for preserving specimens.[659] Moreover, Baird's transgressions were condoned by Governor Mactavish, who turned a blind eye to the supposedly clandestine liquor traffic. Mactavish only felt compelled to sanction the importation of alcohol after Baird had foolishly asked for official permission to send it inward:

> ... it is contrary to rule to send spirits of any kind into McKenzie River except for medicinal purposes, so that if as a medical man you consider Hardistys ailments require something of the kind I may tell you that packages for the Companys officers are never subjected to examination by us

659 Letter from Baird to Kennicott, 13 April 1861, SIA, RU 7002, Box 3, vol.5.

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Such cooperation was, of course, appreciated and Baird's offer to reciprocate was taken up by Mactavish when he requested a very unusual "favour." Mactavish asked Baird to inquire into the purchase of a small press. The Governor planned to use the press to combat the news printed by the anti-HBC Nor'wester.[661]

Baird also sent many items gratis. He sent both popular and scientific literature, as well as copies of the Smithsonian publications, preserving supplies and apparatus.[662] Many collectors received revolvers, felt hats, compasses and burning glasses as well as dog bells and blankets, spy glasses and opera glasses in recognition for their contributions to the Smithsonian collections.[663] Moreover, after returning home to Illinois, Kennicott also responded to northern requests. He sent Onion a set of billiard balls, and Lockhart a ring.[664]

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[660] Letter from W. Mactavish to Baird, 11 Feb. 1867, SIA, HBC Corr Coll, Folder 33.

[661] Letter from Mactavish to Baird, 23 May 1867, SIA, HBC Corr Coll, Folder 33.

[662] Lists of articles sent from Washington, 14 April 1862, SIA, RU 7002, Box 66; Invoice of boxes transmitted by the Smithsonian Institution, 1861, SIA, RU 7002, Box 66.

[663] Distribution of presents to the wives of correspondents of the Smithsonian Institution, 1867. SIA, Temporary Location, HBC Corr Coll.

[664] Letter from Onion to Kennicott, 28 Nov. 1864, SIA, HBC Corr Coll, Folder 34 and letter from Lockhart to Kennicott, 26 June 1865, SIA, HBC Corr Coll, Folder 24.

Baird not only sent his collectors gifts; he made a gift of his services. Simply responding to their many requests for goods from the "civilized" world represented a privilege bestowed on very few people. How many could claim that the Assistant Secretary of the Smithsonian Institution had purchased goods on their behalf? Moreover, he corresponded with each and every collector. For example, he personally wrote 3,050 letters in 1860 alone.[665] Finally, through his position as the pre-eminent American ornithologist, he was able to recognize the contributions made by his most productive collectors by naming new species in their honour. MacFarlane was twice honoured - once in scientific nomenclature, and once in common terminology. <u>Falco gyrfalco var. sacer</u> was referred to as MacFarlane's gerfalcon, while an owl, <u>Otus asio macfarlanei</u> has since been named in his honour.[666] Ross' contributions were similarly recognized. Ross' Snow Goose (<u>Chen Rossi</u> [<u>Chen rossii</u>]) was named in his honour.[667]

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[665] Deiss, "Spencer F. Baird and his collectors," <u>J. Soc. Biblphy nat. Hist</u>. pp.638-639.

[666] The common name is referred to in <u>The History of North American Birds</u>, p.115, and the scientific name can be found in R.T. Peterson, <u>A Field Guide to Western Birds</u>, second ed. (Boston: Houghton Mifflin Co., 1961). It is, however, difficult to determine whether Baird, or some more recent ornithologist, bestowed this honour on MacFarlane.

[667] Baird, <u>The Water Birds of North America</u>, p.445.

It was unanimously agreed that MacFarlane was the most prodigious of Baird's field collectors, and he was also the most highly regarded of the northern "gentlemen."[668] MacFarlane not only contributed more to the Smithsonian programs than any other single individual, he made those contributions with humility and with apparent disregard for remuneration. He asked Baird for presents or "favours" much less often than his colleague Ross. Nor did he openly state his desire for recognition or status through science. He belittled his contribution. He often chided himself for the errors and oversights that riddled his lists, and for the "indifferent manner" in which his specimens were prepared.[669]

One of the very few requests made of the Assistant Secretary by MacFarlane pertained to the distribution of duplicate specimens. He asked for Baird's assistance only hesitantly, and stated repeatedly his dread of inconveniencing or troubling him. He once offered to withdraw his request entirely if it was "... against either the custom or rules of the Insitution to present objects of Natural History to individuals,"[670] although he was less

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668 In 1868 Henry credited MacFarlane with donating over ten thousand specimens. This estimate probably accounts for the large number of oological specimens that were submitted, but were not recorded in the HBC collectors specimen lists. See, SIAR, 1868, p.22.

669 See R.R. MacFarlane Collection, SIA, RU 7215, Box 14.

670 Letter from MacFarlane to Baird, 10 May 1864, SIA, RU 7215, Box 14.

reluctant to ask for assistance in the following two years. In 1865 he asked that Baird send specimens to the Montreal Natural History Society and to Oxford University. In 1866 he asked Baird to forward specimens to the Edinburgh Museum of Science and Art.[671] MacFarlane was more comfortable asking "favours" of Kennicott, although he only ventured to ask for his assistance in procuring some alcohol after having received a letter filled with praise. MacFarlane usually confined his requests to materials needed for the preservation and packing of specimens, or to the instructions needed to facilitate the collecting process. He even offered to purchase his own set of dissecting instruments.[672]

MacFarlane never demanded acknowledgement or recognition, but that does not mean that it was not expected. He used science, no less than the avaricious Ross, to elevate his social status. MacFarlane did, however, differ from Ross in that while he was actively collecting specimens during the 1860s, his attitude reflected the normative patterns operational within the scientific community.[673] MacFarlane's

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671 Letters from MacFarlane to Baird, 8 Feb. 1865, 15 May 1865 and 18 May, 1866, SIA, RU 7215, Box 14.

672 See letters from MacFarlane to Kennicott, 9 Sept. 1864, and from MacFarlane to Baird, 10 May 1864, SIA, RU 7215, Box 14.

673 Robert Merton has delineated four behavioural norms as forming the basis of the scientific ethos. Science functions within the norms of universalism, organized skepticism, communism and disinterestedness. Jerry Gaston furthermore states that while not all of these norms are found at the same time, in one person, they

commitment to science was less calculated than was Ross'. He was committed to working for science on a more abstract level. Both collected specimens to advance scientific knowledge, but Ross was acutely aware of and overtly desirous of the social status that could be acquired through science. Ross tended to extoll the virtues of disinterestedness rather forcefully while MacFarlane, at least during the 1860s, believed that he should give his data to the Smithsonian without thought for fame or fortune. MacFarlane admittedly felt differently after 1900 when advanced age and an inadequate pension prompted him to seek financial compensation for his earlier contributions.[674] But some forty years earlier, when Ross and MacFarlane were actively collecting specimens, their behaviour and attitudes

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constitute the informal rules through which science operates. Robert K. Merton, "The Institutional Imperatives of Science," in Sociology of Science: Selected Readings, ed., Barry Barnes (Penguin Books, 1972),pp.65-79 and, see Jerry Gaston, The Reward System in British and American Science (Toronto: John Wiley & Sons, 1978), pp.3-4.

674 Between 1907 and 1918, MacFarlane tried to obtain financial compensation for his services as a collector, in the form of a Smithsonian or United States government pension. Winnipeg lawyer, Hugh John Macdonald, negotiated on his behalf, but they were unsuccessful in their bid to obtain a pension from either source. The Institution rejected his request, falling back on the policy established by Henry in the 1850s. Neither specimens nor data were to be purchased outright. Nor was the Institution allowed to make contractual agreements with collectors. C.D. Walcott, Secretary of the Smithsonian in 1918, stated in one of the final exchanges between the Smithsonian and MacFarlane's attorney: "... the only recognition that can be made of his cooperation and interest is in the form of references thereto in the publications of the Institution, and this has already been done many times." See correspondence between C.D. Walcott and H.J.

were significantly different. They, in fact, exemplified the differences between inner and overt conformity, a difference well recognized by their contemporaries.[675] Ross' thirst for fame and glory was often derided by his collecting companions, while MacFarlane's industriousness, honesty and humility were applauded:

> Mr MacFarlane continues his collections most indefaticably [sic] in order I think to acquire similar honours as those conferred on Mr Ross - with the difference that the latter gained his distinction by the labours of others while Macfarlane's collections are all his own -[676]

They were his own, of course, to the extent that they had been bought and paid for, rather than stolen.

The traders and trappers who together formed the HBC collecting community performed the most basic, and perhaps the most mundane, activities contained within the scientific process. But both trader and trapper, like their more prestigious colleagues, worked with a purpose. Inuit and Indian incorporated collecting within the barter system

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Macdonald, 17 June 1918, specifically and see correspondence between MacFarlane and Walcott and between MacFarlane and Assistant Secretary R. Rathburn generally. This correspondence is found in the United States National Museum, 1877-1975, Permanent Administrative Files, SIA, RU 192, Box 37, Folder 4, File # 10800 1/2.

[675] This is a distinction made by Hagstrom to describe the difference between those scientists who sincerely adopt the values of the scientific community, from those who only appear to adopt the scientific ethos. "Gift-giving as an Organizing Principle," p.117.

[676] Letter from W.L. Hardisty to Kennicott, 30 Nov. 1864, SIA, HBC Corr Coll, Folder 22.

already established at the HBC posts, while traders such as Ross, MacFarlane, Lockhart and Jones occupied the apex of a hierarchy developed locally to procure natural history specimens. This division of labour was incorporated within another social hierarchy, the scientific community's hierarchy, and within this doubly stratified structure roles and status were well defined. The role of the scientist differed from that of the collector, and the role fulfilled by HBC collectors was quite distinct from that identified with the hobbyist. Northern collectors were labourers rather than dilettantes; technologists rather than amateurs. Each role was accorded prestige appropriate to its function. The status that was acquired reflected the contributions, expertise, training and, most importantly, the desire of participants to obtain recognition within the scientific community. HBC collectors undoubtedly represented the membership of the lowest level of the scientific community's hierarchy, but their activities nevertheless translated into enhanced status. They obtained access to an elite social group, and acquired status amongst a new and valued set of peers. Collecting had provided an opportunity to acquire status outside the traditional confines of their daily lives. The Company could control their fates but indirectly in the realm of science, and the recognition and prestige that they achieved through their new roles as collectors allowed them to dismiss, or at least ignore momentarily, their grievances over deferred status within the Hudson's Bay Company.

EPILOGUE

In 1860 Joseph Henry wrote Governor George Simpson requesting permission to prolong Kennicott's Arctic tenure, and he also asked Simpson to extend similar assistance to another Smithsonian explorer. The Smithsonian wanted to send Constantin Drexler, a taxidermist employed by the Smithsonian,[677] to the James Bay region on an oological expedition. Simpson agreed to both requests and appointed James Anderson, HBC District manager, to assist Drexler in the collecting of eggs in the vicinity of Moose Factory.[678]

Drexler was, compared to Kennicott, poorly educated. He had acquired some field experience in 1857 while assisting Dr. James G. Cooper the naturalist and surgeon assigned to the "wagon road to California via South Pass under William H. Magraw,"[679] but he was subsequently employed by the Smithsonian as a taxidermist not as a naturalist.[680] His

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[677] Numerous references to Drexler's position as a taxidermist are found in SIA, HBC Corr Coll, Folder 16, as well as in the Incoming Correspondence of the Assistant Secretary, 1850-1877. See especially, letters from Drexler to Baird, 27 August 1859, SIA, RU 52 Box 12, Folder 10, vol.16, p.467, and 28 Jan. 1863, SIA, RU 52, Box 19, Folder 21, vol.25, p.480.

[678] Although the London Committee did not officially sanction Henry's request to extend Kennicott's stay until May 1861, Simpson agreed to Henry's request in a letter of 11 Feb. 1860. SIA, HBC Corr Coll, Folder 38. Reference to permission granted by the London Committee is found in a letter from HBC Secretary, E.M. Hopkins to J. Henry, 22 May 1861, SIA, HBC Corr Coll, Folder 23.

[679] SIAR, 1857, p.47.

communication skills were rudimentary. His spelling was phonetic and his penmanship was childlike. He always fell short of Baird's rigorous standards - in both his career and personal life. Where Kennicott met with success, Drexler achieved mediocrity. Kennicott managed to conduct his expedition with economy, and his life exemplified the asceticism associated with singularity of purpose and vision. Kennicott was obsessively, perhaps abnormally, devoted to natural history. On the other hand, Drexler's expedition to James Bay exceeded the allocated funds, and by 1866 his personal life was in a shambles.[681] Drexler ultimately resumed his vocation as a taxidermist after he returned home from a rather inglorious encounter with field work.[682]

Constantin Drexler's journey to James Bay was quite different from Kennicott's travels to the far northern outposts of the Company's territory. The journey between Washington and Moose Factory was not only much shorter than Kennicott's travels to Arctic America, the entire scope of Drexler's expedition was less comprehensive than its more northerly counterpart. He was sent with express instructions

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[680] References to his employment status are found in SIA, RU 7002, HBC Corr Coll, Folder 16 and in RU 53, Box 12, Folder 10, vol.16, p.467.

[681] Drexler's wife, Francisca, solicited Baird's assistance in an acrimonious divorce and there are several letters from Drexler to Baird, 1866-67, regarding a divorce settlement. SIA, RU 7002, Box 19, Folder 21.

[682] Letter from Drexler to Baird, 28 Jan. 1863, SIA, RU 52, Box 19, Folder 21, p.480.

to apply himself to the field of oology, although he was not discouraged from collecting other natural history specimens,[683] and he was instructed to complete his collections and return to Washington before the close of navigation in Autumn.[684]

Drexler left Washington before the end of April 1860, and having stopped at Philadelphia, Montreal and Ottawa en route, he arrived at Moose Factory approximately a month later on 25 May.[685] When he reached Moose Factory he was not entirely late for the egging season, but his efforts were, at any rate, misplaced. Very few eggs were to be found, and as he wrote to Professor Baird:

> this is the wors place for egging i have seen yet, everything is said to breed further north, and if Mr. McKenzie dooes not send me further i would had better staid at home and colected at the Smithsonian ... i will not stay at this infernal post if otherwise can be helpt, as it is shure wher ther ar no birds, ther can be no Eggs, ...[686]

With the assistance of Chief Factor John Mackenzie, he managed to fill eight boxes with specimens during his summer on James Bay.[687] Drexler's collections were, despite

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683 Memo from Henry to Drexler, 24 April 1860, SIA, HBC Corr Coll, Folder 16.

684 Ibid.

685 Drexler's timetable has been derived from his correspondence with Baird between 4 and 26 May 1860, and from a Memorandum to Drexler from Joseph Henry, 24 April 1860. SIA, HBC Corr Coll, Folder 16.

686 Letter from Drexler to Baird, 26 May 1860, SIA, HBC Corr Coll, Folder 16.

687 "Invoice of contents of 8 boxes adressed to the

protestations to the contrary, significant considering the brief period spent in the James Bay region. He sent two hundred and fifty dried bird skins, thirty-three dried fish and mammal skins, a few reptile, fish and embryonic specimens in alcohol, a box (of undefined dimensions) of fossils, three packages of dried plants, two boxes and three packages of shells, sixteen vials of insects and an oological collection containing between six hundred and one thousand specimens to the Smithsonian as a result of his summer excursion.[688] Drexler perhaps overemphasized the extent of his failure, but the size of his collection was small by comparison with that sent out from the Mackenzie River District. But then his expedition really bore little resemblance to Kennicott's, aside from their source of origin and contemporaneity. His visit was brief. His influence was short-lived.

HBC employees stationed south of Methy Portage also sent specimens south. Governor Mactavish was keenly interested in science and he contributed specimens to the Smithsonian Institution, as did William MacMurray (Winnipeg River), Roderick Mackenzie (Lake Manitoba), Hector Mackenzie (Red River Settlement), W.J. Christie (Fort Edmonton), Colin Rankin (Lake Superior) Donald A. Smith (Labrador), Henry

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Smithsonian Institution, Washington, D.C.U.S.", SIA, HBC Corr Coll, Folder 16.

688 The imprecision in the specimen counts is due to the rather vague manner in which Drexler recorded the specimens on the invoice.

Connolly (Labrador), James Anderson(a) (Gulf St. Lawrence) and John Mackenzie (Moose Factory).[689] George Barnston was undoubtedly the most noteworthy contributor to the Smithsonian collections, but he was already an accomplished collector, and his interest in the Smithsonian was sparked by Kennicott rather than Drexler. The Smithsonian program really took off in the north, where established traders and their native "assistants" were willing to exchange their labour, in the form of specimens and data, for the rewards of science.

But both expeditions characterized trends that were to emerge in Arctic exploration over the next forty years. Scientific motivations became increasingly important determinants of northern expeditions after 1860.[690] Arctic exploration continued apace even after the Franklin searches

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[689] Numerous specimens were undoubtedly sent to the Smithsonian by these collectors, although the extent of their contribution is incalculable since the contents of their collections are not itemized on personal registers or packing invoices. Aside from the Registers kept by Donald Gunn, (SIA, Donald Gunn Collection, RU 7215, Box 10) there are no extant records detailing the contributions made by the more southerly collectors in the HBC territories. Unfortunately, Gunn's Registers are no sure indication of his contributions either. Only 104 items are listed in registers, which are generally undated and too superficial to possibly account for the total number of specimens collected over a ten year period. The most accurate estimates of the contributions which were made by other HBC collectors stationed south of Methy Portage, are found in the Annual Report of the Assitant Secretary, where a typical entry states: "Barnston, George - Birds, fishes, &c., from Lake Superior." SIAR, 1862, p.57. See Appendix 8 for a list of HBC collectors stationed south of Methy Portage.

[690] Information on exploration comes from A. Cooke and C. Holland, The Exploration of Northern Canada, pp.220-308.

ceased, but an obsessive desire to find the magnetic north replaced searches for Franklin and the North West Passage. Moreover, several scientific expeditions were dispatched independent of the Polar Expeditions. Institutions such as the American Museum of Natural History, the University of Iowa, the United States Department of Agriculture and the Carnegie Museum sponsored biological and anthropological expeditions to the sub-arctic. In total, the United States sent thirty-four scientific expeditions to British North America (the North West Territories) between the Smithsonian sponsored explorations (1859-60) and 1909, when Peary fixed the location of the magnetic pole.

Cartography also provided some of the impetus behind northern exploration, especially during the 1880s. Geological and surveying expeditions became increasingly important following the purchase of Alaska and the transfer of British possessions in the far north to the Dominion of Canada. Boundary disputes focused Canadian attention on the north, and between 1887 and 1910 the Dominion government and the Geological Survey sponsored nineteen expeditions to survey or patrol their newly acquired possessions.[691] Canadian initiatives in the north after 1887 therefore stand out markedly in comparison with their earlier record.

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[691] See Morris Zaslow on the role of the Canadian Geological Survey in northern exploration, especially Chapters 5-11 in _Reading the Rocks: The Story of the Geological Survey of Canada, 1842-1972_ (Toronto: The Macmillan Co. of Can. Ltd., in assoc. with the Department of Energy Mines & Resources and Information Can., 1975).

Nevertheless, the number of Canadian sponsored expeditions was significantly fewer than the number sponsored by the United States. The combined total of the scientific expeditions fielded by the French (two), German (four), Norwegian (three), British (six) and Canadian (nineteen) did not equal the number of expeditions that originated in the United States. The Smithsonian expeditions marked the beginning of a very productive period in the history of the _scientific_ exploration of the north, but more significantly, they represented the beginning of an American dominated exploratory impulse.

Hudson's Bay Company employees located in Rupert's Land had sent specimens and scientific data to metropolitan centres for almost two centuries before the Smithsonian sponsored Robert Kennicott's exploration of the sub-arctic, but the specimens received by the American institution were distinguished from earlier collections on two counts. More specimens and data were collected in the four years that Kennicott travelled through the north than had ever returned to European ports with ships leaving the Bay, and the Mackenzie River collections were distinguished qualitatively, as well as quantitatively.

Several hundred different zoological species were sent from the sub-arctic. Admittedly, their physical condition often suffered as a result of a lengthy and precarious journey or due to shortages of preservatives and packing materials, but these specimens nevertheless illustrated the types of fauna inhabiting northern ecosystems more comprehensively than ever before. Additionally, the documentation requisite to scientific studies of geographical distribution and speciation, as well as that necessary for identifications based on morphological criteria, accompanied the specimens sent to the Smithsonian. These field notes were an integral component of the Mackenzie River collections, and they attested to the aptitude that the HBC trader-collectors had for fieldwork. They also attested to their ability to follow scientific procedure. HBC collectors carefully measured and recorded several variables. The Mackenzie River collections were consequently especially useful to the classificatory analysis performed by Baird at the Smithsonian.

The Mackenzie River collectors succeeded in sending the appropriate data and the <u>types</u> of specimens needed by Smithsonian scientists because Smithsonian scientists directed fieldwork to an unprecedented extent. They influenced the composition of zoological and anthropological collections through the "Circulars," "Directions" and "Instructions," that were printed and disseminated after 1850. They also controlled collecting by sending trained naturalists, such as Kennicott and Drexler, into the field. The accessions made by the Smithsonian's Natural History Department in the second half of the nineteenth century therefore attest to the success of Baird's efforts to rationalize and systematize fieldwork. But his reforms to the collecting system would have been deferred, if not futile, in the absence of the "volunteers" or "donors" who willingly participated in the Smithsonian Exploration Program.[692] There were but few career scientists at mid-century and quasi-career field naturalists, like Kennicott and Drexler, were fewer still. The institutionalization of science was just beginning, and it would be some time before everyone involved in scientific activities would be

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[692] The ratio of HBC donors to all other private donations to the Smithsonian is represented in Appendix 9.

incorporated within the scientific community as salaried employees.

Baird's programs depended on the labours of volunteers. But the Mackenzie River collectors cooperated with the Smithsonian because scientific activities answered their needs as well. Science provided a route through which status-hungry traders could better their social position, and it was a means by which the native population could increase their purchasing power for American and European goods. The Smithsonian Programs were integrated easily within a larger cultural complex because scientific activities had social and economic functions that were, in many ways, as important as their epistemological functions.

Appendix A

Congressional Appropriations for the Care of Government Collections by the Smithsonian Institution

The following information has been derived from W.J. Rhees, The Smithsonian Institution: Documents Relative to its Origin and History, 1835-1899, Smithsonian Miscellaneous Collections, vol. XLII, (Washington, 1900), and the pages on which the Statutes are referred to in his volume are listed in the first column to the left.

Page	Statute	Date	Amount	and Purpose
607	XI,301	02 June 1858	4,000	care of collections
			1,000	transfer of collections
607	XI,427	03 Mar 1859	4,000	care of collections
611	XII,109	25 June 1860	4,000	care of collections
627	XII,217	02 Mar 1861	4,000	care of collections
			6,000	distribution of specimens
636	XII,350	01 Mar 1862	4,000	care of collections
	XII,747	03 Mar 1863	4,000	care of collections
639	XIII,348	02 July 1864	4,000	care of collections
662	XIV,19	07 Apr 1866	4,000	care of collections
	XIV,316	28 July 1866	4,000	care of collections

663	XIV,464	02 Mar	1867	10,000	care of collections
674	XV,115	20 July	1868	4,000	care of collections
678	XV,307	03 Mar	1869	4,000	care of collections
686	XVI,294	15 July	1870	10,000	care of collections
				10,000	building funds
687	XVI,500	03 Mar	1871	10,000	care of collections
				10,000	building funds
693	XVII,131	18 May	1872	5,000	renovations/distri- bution
	XVII,361	10 June	1872	15,000	care of collections
				10,000	building funds
694	XVII,518	03 Mar	1873	15,000	care of collections
				15,000	building funds
				12,000	heating system
729	XVIII,Part 3,216	23 June	1874	30,000	care/maintenance colls
729-730	XVIII, Part 3, 387	03 Mar	1875	20,000	care of collections
				12,500	maintenance of museum
742	XIX,120	31 July	1876	4,500	building repairs
743	XIX,109	31 July	1876	13,000	care/maintenance of collections
		2 Senate ammendments to these acts gave an additional 17,000.			
743	XIX,350	03 Mar	1877	25,500	care/maintenance/ distribution of collections
	XIX,370	03 Mar	1877	25,000	care of colls from International Ex.
782	XX,233	20 June	1878	25,500	care/main/dist/of collections
783	XX,397	03 Mar	1879	30,500	care/main/dist/of

				collections
XX,417	03 Mar	1879	4,000	care of collections

The following is a list of the scientific and exploration literature published before 1860, containing information on Arctic zoology. This list is based primarly on bibliographical essays written by Edward A. Preble, "A Biological Investigation of the Hudson Bay Region," North American Fauna, no.22, Department of Agriculture, Division of Biological Survey (Washington: Government Printing Office, 1902) and "A Biological Investigation of the Athabaska-Mackenzie Region," North American Fauna, no.27, U.S. Department of Agriculture, Bureau of Biological Survey (Washington: Government Printing Office, 1908). Some of these books have since been edited and reproduced by the Champlain and Hudson's Bay Record Society, while many of the contemporary imprints are contained in the Rare Book Collection, at the Hudson's Bay Company Archives in Winnipeg, Manitoba.

Hearne, Samuel. A Journey from Prince of Wale's Fort in Hudson's Bay to the Northern Ocean. Undertaken by Order of the Hudson's Bay Company , for the Discovery of Copper Mines, A North West Passage, &c. In the years 1769, 1770, 1771 & 1772. Dublin, 1796; reprint ed., London, 1807.

Mackenzie, Alexander. Voyages from Montreal, on the River St. Laurence, through the Continent of North America, to the Frozen and Pacific Oceans. In the years 1789 and 1793. With a preliminary account of the rise, progress and present state of the Fur Trade of that Country. London, 1801.

Harmon, Daniel Williams. A Journal of Voyages and Travels in the interior of North America, between the 47th and 58th degrees of north latitude, extending from Montreal nearly to the Pacific Ocean. Andover, 1820.

Fisher, Alexander. A Journal of a Voyage of Discovery to the Arctic Regions in His Majesty's Ships 'Hecla' and 'Griper.' In the years 1819 & 1820. London, 1821.

Parry, William Edward. Journal of a voyage for the discovery of a N.W. passage from the Atlantic to the Pacific. Performed in the years 1819-20. In His Majesty's Ships 'Hecla' and 'Griper.' London, 1821.

Franklin, John. _Narrrative of a Journey to the shores of the Polar Sea. In the Years 1819, 20, 21 and 22_. London, 1823.

Sabine, Edward. "A Supplement to the Appendix of Captain Parry's [first] Voyage for the Discovery of a North-west Passage in the years 1819-20." 1824.

Richardson, John. "Appendix to Captain Parry's Journal of a Second Voyage." 1827.

Parry, William Edward., and Ross, James Clark. _Journal of a Third Voyage for the Discovery of a Northwest Passage from the Atlantic to the Pacific. Performed in the years 1824-25. In His Majesty's Ships 'Hecla' and 'Fury.'_ 1826.

Franklin, John., and Richardson, John. _Narrative of a Second Expedition to the Shores of the Polar Sea. In the years 1825, 1826, and 1827, by John Franklin_. London, 1828.

Richardson, John. "Short Characters of a few quadrupeds procured on Captain Franklin's late expedition." _The Zoological Journal_ 3:2 (Jan. to April 1828):516-520.

Douglas, David. "Observations on some Species of the Genera _Tetrao_ and _Ortyx_, natives of North America. With Descriptions of Four new Species of the Former, and Two of the Latter Genus." _Transactions of the Linnaean Society_ 16(1829):133,149.

Ross, John. _Narrative of a Second Voyage in Search of a Northwest Passage, and of a Residence in the Arctic Regions during the years 1829, 1830, 1831, 1832, 1833_. London, 1835.

Ross, James Clarke. "Appendix to the Narrative of a Second Voyage in Search of a North-West Passage, and of a residence in the Arctic Regions during the years 1829, 1830, 1831, 1832, 1833." London, 1835.

Back, George. _Narrative of the Arctic Land Expedition to the mouth of the Great Fish River, and along the shores of the Arctic Ocean in the years 1833, 1834, and 1835_. London, 1836.

King, Richard. "Temperature of Quadrupeds, Birds, Fishes, Plants, Trees, and Earth, as ascertained at different times and places in Arctic America, during Captain Back's Expedition." _Edinburgh New Philosophical Journal_ 21(1836):150,151.

King, Richard. _Narrative of a Journey on the Shores of the Arctic Ocean, in 1833, 1834, and 1835. Under the Command of Capt. Back, R.N._ London, 1836.

Richardson, John. "Report on North American Zoology." Sixth Meeting of the British Association for the Advancement of Science for 1836. _Report_ 5(1837):121-224.

Dease, Peter Warren., and Simpson, Thomas. "An Account of the Recent Arctic Discoveries by Messrs. Dease and T. Simpson. Communicated by J.H. Pelly, Esq., Governor of the Hudson's Bay Company." _Journal of the Royal Geographical Society_ 8(1838):213-225.

Richardson, John. "Geographical Distribution of some American Birds." _Ann[als] and Mag[azine] Natural History_ 11(1843):484.

Simpson, Thomas. _Narrative of the Discoveries on the North Coast of America. Effected by the Officers of the Hudson's Bay Company during the years 1836-39._ London, 1843.

Isbister, A.K. "Some Account of Peel River, North America." _Journal of the Royal Geographical Society_ 15:11 (1845):332-345.

McLean, John. _Notes of Twenty-Five Years' Service in the Hudson's Bay Territory._ Two Vols. London, 1849.

Goodsir, Robert Anstruther. _An Arctic Voyage to Baffin's Bay and Lancaster Sound, in Search of Friends with Sir John Franklin._ London, 1850.

Richardson, John. _Arctic Searching Expedition. A Journal of a Boat-Voyage Through Rupert's Land and the Arctic Sea, in search of the Discovery Ships under command of Sir John Franklin._ London, 1851.

Snow, W. Parker. _Voyage of the 'Prince Albert' in search of Sir John Franklin. A Narrative of Every-day Life in the Arctic Seas._ London, 1851.

Osborn, Sherard. _Stray Leaves from an Arctic Journal. Or, Eighteen Months in the Polar Regions, in search of Sir John Franklin's Expedition. In the years 1850-51._ London, 1852.

Peterman, Augustus. "Notes on the Distribution of Animals available as Food in the Arctic Regions." _Journal of the Royal Geographical Society_ 22(1852):118-127.

Rae, John. "Journey from Great Bear Lake to Wollaston Land." _Journal of the Royal Geographical Society_ 22(1852):73-82.

Rae, John. "Recent Explorations along the South and East Coast of Victoria Land." Jour. Roy. Geog. Soc. 22(1852):82-96.

Sutherland, Peter C. Journal of a Voyage in Baffin's Bay and Barrow Straits. In the years 1850-1851. Performed by H.M. Ships 'Lady Franklin' and 'Sophia.' Under the command of Mr. William Penny in search of the Missing Crews of H.M. Ships 'Erebus' and 'Terror.' London, 1852.

Hooper, W.H. Ten Months among the tents of the Tuski. With Incidents of an Arctic Boat Expedition in search of Sir John Franklin, as far as the Mackenzie River, and Cape Bathurst. London, 1853.

Inglefield, E.A. A Summer Search for Sir John Franklin. With a Peep into the Polar Basin. With Short Notices, by Professor Dickie, on the Botany, and by Dr. Sutherland, on the Meteorology and Geology. London, 1853.

Kennedy, William. A Short Narrative of the Second Voyage of the 'Prince Albert,' in search of Sir John Franklin. London, 1853.

Franchere, Gabriel. Narrative of a Voyage to the Northwest Coast of America in the years 1811, 1812, 1813, and 1814. Or the First American Settlement on the Pacific. New York, 1854.

Richardson, John. The Zoology of the Voyage of H.M.S. 'Herald,' under the command of Captain Henry Kellett. During the years 1845-51. London, 1854.

Belcher, Edward. The Last of the Arctic Voyages. Being a Narrative of the Expedition in H.M.S. 'Assistance,' under the command of Captain Sir Edward Belcher, C.B., in search of Sir John Franklin. During the years 1852, 1853, 1854. Two Vols. London, 1855.

[Anderson, James.] "Letter from Chief Factor James Anderson, to Sir George Simpson, F.R.G.S., Governor in Chief of Rupert Land." Jour. Royal Geog. Soc. 26(1856):18-25.

[M'Clintock, C.L.] "Extracts from Captain M'Clintock's Diary." The Dublin University Zoological Association. The Natural History Review. Proc. of the Dublin Nat. Hist. Soc. 3(1856):40-42.

Osborn, Sherard. the Discovery of the North-West Passage by H.M.S. 'Investigator.' Capt. R. M'Clure, 1850, 1851, 1852, 1853, 1854. London, 1856.

[Anderson, James.] "Extracts from Chief-Factor James Anderson's Arctic Journal." Jour. Royal Geog. Soc. 27(1857):321-328.

Armstrong, Alexander. _A Personal Narrative of the Discovery of the North-west Passage. With Numerous Incidents of Travel and Adventure during nearly five years' continuous service in the Arctic regions while in swearch of the Expedition under Sir John Frranklin_. London, 1857.

[Billing, E.] "Gleanings in the Natural History of the Hudson's Bay Company's Territories." _Canadian Naturalist and Geologist_ 2(July 1857):170-188.

M'Dougall, George F. _The Eventful Voyage of H.M. Discovery Ship 'Resolute' to the Arctic Regions in search of Sir John Franklin and the missing crews of H.M. Discovery Ships 'Erebus' and 'Terror,' 1852, 1853, 1854_. London, 1857.

M'Clintock, F.L. _The Voyage of the 'Fox' in the Arctic Seas. A Narrative of the Discovery of the Fate of Sir John Franklin and his companions_. Boston, 1860.

Walker, D. "Notes on the Zoology of the Last Arctic Expedition under Captain Sir F.L. M'Clintock, R.N." _Proc. Roy. Soc. Dublin_ 3(1860):61-67.

Appendix B

The following lists have been extracted from specimen invoices sent south by Bernard Rogan Ross, Strachan Jones and Charles P. Gaudet. The extract taken from Gaudet's specimen list is representative, rather then exhaustive, because the only extant invoice attributed to Gaudet contains over one hundred lenghty entries. There is some doubt that Gaudet himself composed this list since the penmanship and language skills are so superior to that found in his correspondence with Baird (SIA, HBC Corr. Coll. Folder xx), but the lists written by Ross and Jones are authentic, and they have been reproduced in their entirety.

These extracts are essentially verbatim reprints of the originals, although some abbreviations have been expanded to account for contemporary typographical limitations. The spellings are, however, unchanged from the original in order to illustrate the different levels of sophistication attained by the collectors. These lists also illustrate the many different types of specimens collected by these individuals, and allude to the quantity of specimens sent south.

All three invoices have been preserved in the Smithsonian Institution Archives, Division of Birds, RU 7215, Collected Notes, Lists and Catalogs on Birds, 1839, 1849-51, 1855-65. Ross' list is contained in Box 29, Folder: "Bernard Rogan Ross." Jones' list is contained in Box 13, and Gaudet's list is contained in Box 9.

------ Index Continued ------

Nettion carolinensis	Nos. 545	C.P. Gaudet
[?] Americana	544, 549	B.R. Ross and C.P. Gaudet
Bucephala Albeola	617	B.R. Ross
Histrionicus Torquatus	560	James Flett
Pelionetta Perspicillata	[?]	Charles P. Gaudet
Mergus serrator	[?]	Charles P. Gaudet
Stercorarius Pomarinus	[?]	Bernard R. Ross
Stercorarius Parasiticus	550	Bernard R. Ross
Stercorarius cepphus	561	James Flett
Larus Glaucorcens	559	Bernard R. Ross
Larus Delang---sis	627	Bernard R. Ross
Croicotophalas philadelphia	an error name received	
Plesa septentrienatis	528	Bernard R. Ross
Sterna Macrura	461,2,3,[?] 6,7, [??]	Bernard R. Ross
Colymbus Torquatus	541,542,555, 556,557	Bernard R. Ross
Podiceps Griseigena	539	Charles P. Gaudet
Colymbus Arcticus	534,565,526, 537,538,539	Bernard R. Ross and Charles P. Gaudet

------Skulls (without skins) ----

five specimens - illegible

Vulpes Fulvus	Bernard R. Ross
Mustela Americana	Ditto

------ EGGS ------

Turdus swainsonii	505,507,515, 520,601	Bernard R. Ross
Turdus migratorius	[?]	Ditto
Dendroica AEstiva	[?]	Ditto
Setophaga ruticilla	512,[?]	Ditto
Passerella iliaca	[?]	Ditto
Micropalama Himantopus	600	Ditto
Mareca Americana	549	Ditto

Bucephala Americana	578	Ditto
Bucephala Albeola	576	Ditto
Larus glaucescens	577	Ditto
Unidentified and Sundry	621,622,623	B.R. Ross and R.R. MacFarlane

------ EMBREYOS ------

6 of Hesperemys Hyoiotes	743	Bernard R. Ross
4 of Tringoides Macularius	741	ditto
6 of Bucephala Americana	742	ditto
8 of Sundry Birds	744	ditto
5 of Do Do in Eggs	748	ditto

------ FISH ------

3 young carp	730	Bernard R. Ross

------- INSECTS -------

a vial from Peels River and Youcon	745	C.P.Gaudet and J. Lockhart
a vial from Lapierres House	746	James Flett
a vial from Fort Simpson and Southward	747	Berrnard R. Ross and Andrew Flett

------ GEOLOGICAL ------

a can of mineral tar	605	B.R. Ross
fossils, rock crystal &c.	624	do
Blue ochre	753	James Lockhart

------ ETHNOLOGICAL ------

I. 1 DOG RIB TRIBE		
a babiche work hunting bag	620	B.R. Ross
II. LOUCHEUX TRIBE (KOOTCHIN BRANCH) Russian America		
2 Shirts or tunics	595,627	Do
3 Mittens	596	Do
4 Shell ornaments	633	Do
III. (MANKOOTCHIN BRANCH) Russian America		
5 a chiefs dress complete, contain shirt, trousers, mittens, feather, neck, forehead and ear ornaments, Flint and steel, Paint bag, Quiver, Bow, knife and sheath ---------	636	Do
IV. (PEELS RIVER BRANCH)		
6 SHIRTS	625,626	DO
7 Mittens	625,626	Do
8 Hoods	625,626	Do
9 Trousers	625,626	Do
V. SLAVE TRIBE		
10 Babiche sled line	590	Do
VI. ESKIMOS NATION		
11 Wooden fire producers	585,586	Do
12 Ivory needle cases	590,593,604	Do

13	Goose and wildfowl Lassoes	590	Do
14	Bow needles	591,591	Do
15	-- and arrow polishers	591	Do
16	Lance head	592	Do
17	String	592	Do
18	Fish hooks	592,593	Do
19	Knife	606	Do
20	Adies	607,608	Do
21	Picks	609,610	Do
22	Earth Chisel	611	Do
23	Spear or Dart	612	Do
24	Pipe	629	B.R. Ross
25	Womans gown	634	Do
26	Quiver of arrows	751,752	Do

------ SHELLS ------

a box of uni and bivalves	620	Bernard R. Ross

------ End of the Catalogue ------

Fort Simpson, McKenzies River
15 April 1861
Bernard Rogan Ross. C.T.

List of Specimens of Natural History Collected by Charles P. Gaudet at Fort Good Hope, MacKenzie's River from Winter 1864, to Spring 1865 viz, &:

------Number 102------

Pediocetes Phasianellus - female and 5 eggs, 7 June 1864. Nest was found on ground and the parent bird said to have been snared thereon by an Indian. Composed of grass &c.

------Number 103------

Pediocetes Phasianellus - female and 7 eggs. 17 June '64. Nest on ground and at no great distance from breeding. Female snared thereon.

------Number 113------

Falco Columbarius - male and 2 eggs. 17 June 1864. Nest on a cliff, and the male parent was shot in its immediate vicinity.

------Number 115------

Putorius - skin - captured at Peel's River in July 1862, and forgotten to be sent out with the Collections, made at that post (101 specimens)

------Number 123------

Zonotrichia Gambellii - 4 eggs June '64 Neston ground & composed of fine hay &c. Parent seen & said to have been a sparrow of this species.

------Number 124------

Zonotrichia Gambellii - female skin. 18 June '64. Eggs got broken Nest on ground and the female was snared thereon.

------Number 140------

Turdus Aliciae - female and 3 eggs (2 broke) June '64. Nest on a tree, and female snared thereon, it is said.

------Number 145------

Cotyle Riparia - female and 1 egg (nest broke) 21 July '64. Found in another mudy [sic] sand bank - eggs evidently contained largely developed embryos, & no wonder at such a late date.

------Number 152------

Vulpes Fulvus var. Decussatus - male skull. Killed winter '63-'4, tho' marked "22 July '64" this being the date of their cleansing!

------Number 163------

Mustella Americana - female skull of an animal caught in a wood in trap near Good Hope winter 1864-5.

------Number 177------

A Man's Smoking Pipe - Anderson River Esquimaux

------Number 178------

A Woman's Ditto - Anderson River Esquimaux

------Number 179------

A Lad's Ditto - Anderson River Esquimaux

------Number 180------

An Esquimaux Knife - Anderson River.
Large knives of this kind are generally used for cutting up meat and blubber, also snow in squares for building houses in winter when the Esquimaux travel.

------Number 181------

A Woman's Knife or Skin Scraper - Anderson River Esquimaux

------Number 182------

A Bone Cutting Saw - Anderson River Esquimaux. Used also for sawing wood and ivory &c.

------Number 183------

A Woman's Ivory Needle Case - Anderson River Esquimaux

------Number 184------

A Small Arrow Dressing [?] Knife Anderson River Esquimaux

------Number 187------

A Small Wooden Tool Board - Anderson River Esquimaux

------Number 188------

A Small Ditto Ditto - Anderson River Esquimaux

------Number 189------

A Set of Ivory Bow Needles (3 p's) Anderson River Esquimaux

------Number 190------

A Drilling Machine - (5 ps) Anderson River Esquimaux

------Number 191------

An Ivory Fish hook - Anderson River Esquimaux

------Number 192------
Two Seal Harpoon heads - Anderson River Esquimaux

------Number 193------
Two Bone Arrow Points of Machine used for Darting at wild fowl &c. in the water. Anderson River Esquimaux

------Number 194------
A bone holder used while dressing arrows - Esquimaux

------Number 195------
A pair Men's large deers skin Mittens - Anderson Esquimaux

------Number 196------
A pair Men's deerskin Boots - Anderson Esquimaux

------Number 197------
A pair Men's Walrus skin Mittens - Anderson Esquimaux

------Number 198------
A pair Men's Water proof Sealskin Boots - Anderson Esquimaux

------Number 199------
Model of an Esquimaux "Kayak" or Canoe. Anderson Esquimaux

------Number 200------
Model of a Pair Loucheux Snow Shoes - MacKenzie's River tribe

------Number 203------
A pair Children's Boots - Esquimaux

------Number 204------
A fire steel - Esquimaux. MacKenzie or Anderson River

------Number 212------
A large Box of Esquimaux Manufacture.

[and so on until Number 222]

List of Specimens collected at Lesser Slave Lake
Spring 1868 by Strachan Jones

5	eggs of the	whiskey jack	with parent bird
17	eggs - - -	wax wing	- - - - - - - -
3	- - - - - -	Hawk owl	- - - - - - - -
150	- - - - - -	Black bird	three or four - -
150	- - - - - -	Thrush	different kinds - - -
12	- - - - - -	New Bunting	- - - - - - - -
3	- - - - - -	Bank [?] Swallow	- - - - - - - -
2	- - - - - -	Crane	no parent bird
6	- - - - - -	Grebe	- - - - - - - -
6	- - - - - -	Water Hen	- - - - - - - -
4	- - - - - -	Woodpecker	- - - - - - - -
5	- - - - - -	Snipe	- - - - - - - -
4	- - - - - -	Sandpiper	- - - - - - - -
50	- - - - - -	Gull different kinds	- - - - - -
20	- - - - - -	Plover different kinds	- - - -
5	- - - - - -	Canvas back Duck	with parent
4	- - - - - -	Ring neck Plover	- - - - - - - -
5	- - - - - -	[??]	- - - - - - - -
20	- - - - - -	Duck	no parent bird

About a pint of small sparrow and yellow birds
eggs some with the Parent Bird some not.
A quantity of eggs unidentified
40 shells of the fresh water mussels
a few shells of the snail and small bivalves

Appendix C

A List of private donations made to the Smithsonian Institution to Finance Exploration in HBC Territories

The following information is a verbatim transcription of records kept by Spencer F. Baird regarding the funds raised for exploration in the Hudson's Bay Company territories. These records are part of the Spencer F. Baird Papers, 1833-1889, RU 7002, SIA, and are found in Box 66, Smithsonian Institution Explorations, 1852-76, HBC Territories Expeditions, 1859-62, of that Record Unit.

Subscriptions to Kennicott's exploration of the Hudsons bay Territories

1859 April	Smithsonian Institution (paid direct to Kennicott)		50.00
	S F Baird	Wash	50.00
	J.C. Brevoort	Brooklyn	50.00
	John Cassin	Phila	50.00
	Geo. N. Laurence	NY	25.00
	Jas. C. McGuire	Wash	50.00
	R. Ostensacken	Wash	50.00
	E.T. Cresson	Phila	20.00
	Isaac Lea	Phila	20.00

	J.D. Sergeant	Phila	25.00
	Dr. Logan	Phila	25.00
	John Lambert	Phila	25.00
	A.J. Talle	Wash (sent in draft)	50.00
			440.00
	Miss Connie E. Swift	Chicago	25.00
	University of Chicago per H.M. Walker		250.00
	Audubon Club	Chicago	175.00
1860 May	Smithsonian Institution	Bill exp J.M. Woodworth	142.23
	Smithsonian Institution to HB House,	Montreal	200.00
	W.H. Edwards	New York	50.00
	Dr. H. Bryant	Boston	50.00
	Chicago Acad Science (paid to Woodworth)		50.00
	J.C. McGuire	Wash	25.00
	Geo. N. Laurence	NY	25.00
	J.C. Brevoort	Brooklyn	50.00
	J.L. Leconte	Phila	50.00
	John Cassin	Phila	50.00
			350.00
1861	Smithsonian Institution to HB House		250.00
	Dr. Geo. Suckley	NY	30.00
	R. Ostensacken	Wash	50.00
	A.L. Heermann	Phila	50.00

	John Kuder	Phila	25.40
			155.40
	Dr. Leconte? (was it paid)		25.00
	Geo. N. Laurence	Bill of guns 14.13 ______ bill 15.72	29.85
	Dr. Bryant	Boston	100.00
	J.C. Brevoort	Brooklyn	25.00
			335.25
	W.H. Edwards	NY	50.00
1862	Smithsonian Institution to Montreal released 243.13 to Kennicott's credit)		250.00
	Dr. Bryant		200.00
	R. Ostensacken		50.00
	Prof. Agassiz sent to Donald Gunn)		50.00

Subscription to other explora-

1860 C. Drexler Hudson Bay

Dr. Bryant	250.00
W.H. Edwards	25.00
E. Norton	25.00
J. Cassin	25.00
	325.00

Appendix D

Appointment, according to Post, within the Mackenzie River District, 1858/59-1859/60.

The following information has been obtained from the Minutes of Council, Northern Department, 1858-69: 1858, Resolution 13; 1859, Res. 12; 1860, Res. 12; 1861, Res. 12; 1862, Res. 11; 1863, Res. 11; 1864, Res. 11; 1865, Res. 11; 1866, Res. 11; 1867, Res. 11; 1868, Res. 11, and; 1869, Res. 12. PAM, H.B.C.A., B.239/k/13.

Name	Fort	Position	Year
Bernard R. Ross	Simpson	Chief Trader	1858-1859
Thomas Swanston		App.Post Master	
Alex. Mackenzie	aux Liards	Clerk	
James Pruden	Halkett	Clerk	
W.L. Hardisty	Youcan	Chief Trader	
James Lockhart	Peel's River	Clerk	
William Brass	LaPierre's House	Interpreter	
R.R. MacFarlane	Good Hope	App. Clerk	
C. Gandes	Resolution	Post Master	
Laurence Clarke	Rae	Clerk	
John Reid	Big Island	Post Master	
Nicol Taylor	Norman	Post Master	
H. Maxwell	Disposable	Chief Trader	
J.V. Dunlop		App. Clerk	
B.R. Ross	Simpson	Chief Trader	1859-1860
J.S. Onion		Clerk	
Thos. Swanston		App. Clerk	
Alex. Mackenzie	aux Liards	Clerk	
J.V. Dunlop	Halkett	Clerk	
W.L. Hardisty	Youcon	Chief Trader	
Strachan Jones		App. Clerk	
C.P. Gaudet	Peel's River	Post Master	
James Flett	LaPierre's H.	Interpreter	
R.R. MacFarlane	Good Hope	Clerk	
James Lockhart	Resolution	Clerk	
Laurence Clarke	Rae	Clerk	

B.R. Ross	Simpson	Chief Trader	1860-1861
J.S. Onion		Clerk	
Andrew Flett		Post Master	
John Reid	Big Island	Post Master	
A. Mackenzie	aux Liards	Clerk	
J.V. Dunlop	Halkett	Clerk	
Nicol Taylor	Norman	Post Master	
R.R. MacFarlane	Good Hope	Clerk	
C.P. Gaudet	Peel's R.	Post Master	
James Flett	LaPierre's H.	Interpreter	
J. Lockhart	Youcon	Clerk	
S. Jones		App. Clerk	
W. Brass		Post Master	
L. Clarke	Rae	Clerk	
W.L. Hardisty	Resolution	Chief Trader	
B.R. Ross	Simpson	Chief Trader	1861-1862
J.E. Harriott		App.Post Master	
John Reid	Big Island	Post Master	
W.L. Hardisty	Liards	Chief Trader	
Andrew Flett	Halkett	Post Master	
Nicol Taylor	Norman	Post Master	
J.S. Onion	Good Hope	Clerk	
R.R. MacFarlane	Anderson	Clerk	
C.P.Gaudet	Peel's R.	Post Master	
James Flett	LaPierre's H.	Post Master	
J. Lockhart	Youcon	Chief Trader	
S. Jones		App. Clerk	
W. Brass		Post Master	
L. Clarke	Rae	Clerk	
A. Mackenzie	Resolution	Clerk	
W.L. Hardisty	Simpson	Chief Trader	1862-1863
W. Thomson Smith		App. Clerk	
Nicol Taylor	Liards	Post Master	
W. Brass	Halkett	Post Master	
A. Flett	Norman	Post Master	
J. Lockhart	Youcon	Chief Trader	
S. Jones		App. Clerk	
J.S. Onion	Good Hope	Clerk	
C.P. Gaudet	Peel's R.	Post Master	
J. Flett	LaPierre's H.	Post Master	
R.R. MacFarlane	Anderson	Clerk	
Ed. Harriott		App. Clerk	
John Reid	Big Island	Post Master	
A. Mackenzie	Resolution	Clerk	
L. Clarke	Rae	Clerk	
W.L. Hardisty	Simpson	Chief Trader	1863-1864
J.S. Onion		Clerk	

Thos. Hardisty		App. Clerk	
A. Mackenzie	Liards	Clerk	
W. Brass	Halkett	Post Master	
Nicol Taylor	Norman	Clerk	
William McLean		App. Clerk	
C.P. Gaudet	Good Hope	Clerk	
A. Flett	Peel's R.	Post Master	
S. Jones	Youcon	Clerk	
James MacDougall		App. Clerk	
W.T. Smith	Anderson	App. Clerk	
John Reid	Big Island	Post Master	
J. Lockhart	Resolution	Chief Trader	
W.C. King		App. Clerk	
R.R. MacFarlane	Rae	Clerk	
W.L. Hardisty	Simpson	Chief Trader	1864-1865
J.S. Onion		Clerk	
W.J. McLean	Liards	Clerk	
W. Brass	Halkett	Post Master	
Nicol Taylor	Norman	Clerk	
C.P. Gaudet	Good Hope	Clerk	
A. Flett	LaPierre's H.	Post Master	
S. Jones	Youcon	Clerk	
J. MacDougall		App. Clerk	
R.R. MacFarlane	Anderson	Clerk	
John Reid	Big Island	Clerk	
J. Lockhart	Resolution	Chief Trader	
W.C. King		App. Clerk	
W.T. Smith	Rae	Clerk	
W.L. Hardisty	Simpson	Chief Trader	1865-1866
J.S. Onion		Clerk	
W.J. McLean	Liards	Clerk	
W. Brass	Halkett	Post Master	
Nicol Taylor	Norman	Clerk	
C.P. Gaudet	Good Hope	Clerk	
A. Flett	Peel's R.	Post Master	
J. Flett	LaPierre's H.	Post Master	
S. Jones	Youcon	Clerk	
R.R. MacFarlane	Anderson	Clerk	
John Reid	Big Island	Clerk	
J. Lockhart	Resolution	Chief Trader	
W.C. King		App. Clerk	
Thos. Hardisty	Rae	App. Clerk	
J. MacDougall	Disposable	App. Clerk	
A. Mackenzie	Disposable	App. Clerk	
W.L. Hardisty	Simpson	Chief Trader	1866-1867
W.F. Gairdner		Clerk	
R.R. MacFarlane		Clerk	
W. Brass		Post Master	
J. MacDougall	Youcon	Clerk	

R.G. Cowley		App. Clerk	
J.S. Onion	Thickney	Clerk	
W.C. King		App. Clerk	
W.J. McLean	Liard	Clerk	
James Hackland	Resolution	Chief Trader	
Thos. Swanston		App. Clerk	
S. Jones	Rae	Clerk	
John Reid	Big Island	Clerk	
N. Taylor	Norman	Clerk	
Thos. Hardisty	Good Hope	App. Clerk	
A. Mackenzie	Anderson	App. Clerk	
A. Flett	Peel's R.	Post Master	
J. Flett	LaPierre's H.	Post Master	
W.L. Hardisty	Simpson	Chief Trader	1867-1868
W.F. Gairdner		Clerk	
James Flett		Post Master	
W.J. McLean	Liard	Clerk	
J.S. Onion	Nelson	Clerk	
A. Mackenzie	Halkett	Clerk	
John Reid	Big Island	Clerk	
Thos. Swanston	Resolution	Post Master	
F. Beaulieu	Salt River	Post Master	
W.C. King	Rae	Clerk	
N. Taylor	Norman	Clerk	
T. Hardisty	Good Hope	Clerk	
W. Brass	Anderson	Post Master	
A. Flett	Peel's R.	Post Master	
John Wilson	LaPierre's H.	Clerk	
J. MacDougall	Youcon	Clerk	
R.C.S. Cowley		App. Clerk	
R.R. MacFarlane	Disposable	Clerk	
W.L. Hardisty	Simpson	Chief Trader	1868-1869
W.M. McKay		Clerk	
R.R. MacFarlane		Clerk	
W.J. Gairdner		Clerk	
J. Flett		Post Master	
W.J. McLean	Liard	Clerk	
J.S. Onion	Nelson	Clerk	
W. Brass	Halkett	Post Master	
John Reid	Hay River	Clerk	
King Beaulieu	Fondulac	Interpreter	
W.C. King	Rae	Clerk	
N. Taylor	Norman	Clerk	
A. Flett	Peel's R.	Clerk	
John Wilson	LaPierre's H.	Clerk	
J. MacDougall	Youcon	Clerk	
Nicol Indair		Post Master	
Thos. Swanston	Rapids	Clerk	
W.L. Hardisty	Simpson	Chief Trader	1869-1870

R.R. MacFarlane		Chief Trader
N.M. McKay		Clerk
W.J. Gairdner		Clerk
J. Flett		Post Master
W.J. McLean	Liards	Clerk
J.S. Onion	Nelson	Clerk
W. Brass	Hay River	Post Master
T. Swanston	Resolution	Clerk
F. Beaulieu	Fond du lac	Interpreter
N.P.[?] King	Rae	Clerk
J. Bird	Providence	Clerk
L. Bouvier		Interpreter
N. Taylor	Norman	Clerk

(plus 6 new names, uninvolved in collecting activities)

Appendix E

The following is an extract from an invoice in Baird's records, of the books sent to his northern collectors. These records fill several pages and Baird sent books to 14 different recipients, including Donald Gunn, William Mactavish, John Reid, James Lockhart, Robert Campbell, Charles Gaudet, Roderick MacFarlane, Lawrence Clarke, James Dunlop, William Hardisty, Nicol Taylor, Alexander Mackenzie and the Norway House Library, however, Bernard Rogan Ross received the largest number of books in 1861. The following is a verbatim extract, with bracketed information included regarding the Smithsonian publications, and is found in the Spencer F. Baird Papers, RU 7002, Box 66, SIA.

Invoice of books etc. transmitted by the Smithsonian Institution to St. Paul in March 1861 for B.R. Ross.

Smithsonian publications Nos,

113, [Discussion of the magnetic and meteorological observations made at the Giraud College observatory, Philadelphia, in 1840, 1841, 1842, 1843, 1844, and 1845. Part I. Investigation of the eleven year peiod in the amplitude of the solar-diurnal variation and of the disturbances of the magnetic declination. By A. D. Bache, 1859].

114, [Observations on terrestrial magnetism in Mexico. Conducted under the direction of Baron Von Mu1672ller, with notes and illustrations of an examination of the volcano Popocatapetl and its vicinity. By August Sonntag, 1860]

119, [On fluctuations of level in the North American lakes. By Charles Whittlesey, 1860]

100, [An Account of the total eclipse of the sun on September 7, 1858, as observed near Olmos, Peru. By Lieutenant J.M. Gilliss, 1859]

81, [On the recent secular period of the aurora borealis. By Professor Denison Olmsted, 1856] 84, [Appendix. Record of auroral phenomena observed in the higher northern latitudes. Compiled by Peter Force, 1856]

19, [Directions for meteorological observations, intended for the first class of observers. By Arnold Guyot, 1850]

31, [A Collection of meteorological tables, with other tables useful in practical meteorology. By Arnold Guyot, 1852]

103, [Meteorological observations made at Providence, Rhode Island, extending over a period of twenty-eight years and a half, from December, 1831, to May, 1860. By Professor Alexis Caswell, 1860]

131, [Meteorological observations made near Washington, Arkansas, extending over a period of twenty years, from 1840 to 1859, inclusive. By Nathan D. Smith, 1860]

15, [Aboriginal monuments of the State of New York. Comprising the results of original surveys and explorations; with an illustrative appendix. By E.G. Squier, 1850]

70, [The antiquities of Wisconsin, as surveyed and described. By I.A. Lapham, 1855]

86, [Observations on Mexican history and archaeology, with a special notice of Zapotec remains, as delineated in Mr. J.G. Sawkin's drawings of Mitla, Etc. By Brantz Mayer, 1856]

115, [Extracts from the proceedings of the Board of Regents of the Smithsonian Institution, in relation to the electro-magnetic telegraph. 1861]

44, [A flora and fauna within living animals. By Joseph Leidy, 1853]

82, [Investigations, chemical and physiological, relative to certain American vertebrata. By Professor Joseph Jones, 1856]

89, [North American Oology. Part I. Raptores and Fissirostres. By Thomas Mayo Brewer, 1857]

102, [Catalogue of the described diptera of North America. By R. Osten Sacken, 1859]

118, [Catalogue of the described lepidoptera of North America. By John G. Morris, 1860]

108, [Catalogue of North American birds, chiefly in the museum of the Smithsonian Institution. By S.F. Baird, 1859]

128, [Check-lists of the shells of North America. By Isaac Lea, P.P. Carpenter, William Stimpson, W.G. Binney and Temple Prime, 1860]

86, [see above] 2, [Smithsonian Contributions to Knowledge. Vol. I. 1848 containing Squier and Davis, Ancient Monuments, Mississippi valley]

110, [Annual Report of the Board of Regents of the Smithsonian Institution, showing the operations, expenditures, and condition of the Institution for the year 1859]

34, (20 copies each) [Directions for collecting, preserving, and transporting specimens of natural history. 3rd edition, 1859]

71, [Archaeology of the United States, or sketches, historical and bibliographical, of the progress of information and opinion respecting vestiges of antiquity in the United States. By Samuel F. Haven, 1856]

Laurence, Lecture on Physiology

Murry, Prairie Traveller

Reason why in Natural History

Page, Handbook of geological Terrus

Baird, Cyclop. Natural Science

Lyell, Principles of Geology

Dana,[?] Household book of Poetry

Wood, Natural History of Mammals

Richardsons Polar Regions

Buchmann, Agtee Language

Krusenstem vocabulary Russian American Indians

Holmberg, Ethnographic col Sketches R. America

Esquimaux vocabulary

Natural History of Chile

XI. vol P.R. Survey

XII. vol. part I, P.R. Survey

Suckley and Cooper, Nat. History of Washington Ter. from George Gibbs

Greenhown, Oregon and California Ter. from George Gibbs

Rascors Knights of England

Giffords Daviad and Maevid

The Portraiture of a Christian Gentleman

Living for Improvement

Foxs book on Martyrs

The way to do good

Mather on the types of the Old Testament

Giles first book in Latin

Parleys cyclopedia of Botany

Keith on the Globe

Hitchcocks De la Baches Geology

Scientific class book of Physical Science

Scientific tracts

Parrys voyages to discover a North West Passage

History of Switzerland

Juvenile Scrap Book

The Husband Hunter 2 vol.

Nicholas Nickelby

De Vere or the man of Independence

"Our Island" 2 vol.

Camperdown or the news from our neighbourhood

Alban

Burns Poetical works

Byrons Life and Letters

Spencers works and memorys

Sacred Poetry

Lives of Hale Bedell and Rochester

Medical and Surgical monographs

1 bundle misc novels from Wm A. Henry

Appendix F

The following list represents those entries in the History of North American Birds and in The Water Birds of North America in which contributions made by the HBC collectors were formally acknowledged. Each entry listed here has, to some extent, been influenced by the field notes or physical specimens submitted by the HBC collectors. The authors of these volumes (Baird, Brewer and Ridgway) are exhaustive when crediting field collectors efforts, and notes on the geographical distribution and habitat, the measurement and colouration, or the breeding and nesting habits of each species include memoranda regarding the sources of the data or specimens used. The contributions of Bernard Rogan Ross and Roderick MacFarlane are, for example, individually mentioned not less than 200 times in these monographs (five volumes in total) but the contributions of the other HBC collectors, including Donald Gunn, George barnston, Strachan Jones, James Lockhart, John Reid, John Mackenzie, James Sibbeston, Laurence Clarke, James Flett and Charles Gaudet, are also mentioned many times.

The special contributions made by the HBC collectors to these series were given added recognition in 1891, when an entire volume of the _Proceedings of the United States National Museum_ (XIV) was devoted to the HBC ornithological collections. Roderick Ross MacFarlane wrote a brief introduction to "Notes on and List of birds and eggs collected in Arctic America, 1861-1866," which was an abridged account of the "memoranda" and specimens used by Baird, Brewer and Ridgway in their monographs on the land and water birds of North America.

Twentieth century revisions of both common and scientific nomenclature are included paranthetically to obviate an anachronous presentation of the data. Some of the species included below have undergone several name changes during the last one hundred years and, in fact, a "modernized" nomenclature was used in the _Proceedings_ (XIV) devoted to the HBC collections, but only the currently accepted designation is indicated in the following Appendix. Classifications unaccompanied by parenthetic revisions are identical to the designations sanctioned by the American Ornithologist's Union Checklist (1983 and 1985 Supplement).

History of North American Birds

OLIVE-BACKED THRUSH; SWAINSON'S THRUSH Turdus swainsoni [Catharus ustulatus]	specimens vol.1, 14
OREGON ROBIN; VARIED THRUSH Turdus naevius [Ixoreus naevius]	notes vol.1, 29
BROWN-CAPPED CHICKADEE [BOREAL CHICKADEE] Parus hudsonicus	specimens and notes vol.1, 107
TENNESSEE WARBLER Helminthophaga peregrina [Vermivora peregrina]	specimens vol.1, 205-206
ORANGE-CROWNED WARBLER Helminthophaga celata var. celata [Vermivora celata]	notes vol.1, 204
YELLOW WARBLER Dendroica aestiva [Dendroica petechia]	specimens and notes vol.1, 223-224
BLACK AND YELLOW WARBLER [MAGNOLIA WARBLER] Dendroica maculosa [Dendroica magnolia]	notes vol.1, 232-234
YELLOW RED POLL WARBLER [PALM WARBLER] Dendroica palmarum	notes vol.1, 273-275
SMALL-BILLED WATER THRUSH Seiurus noveboracensis	notes vol.1, 284
MOURNING WARBLER Geothlypis philadelphia [Oporornis philadelphia]	notes vol.1, 302
AMERICAN REDSTART Setophaga ruticilla	specimens and notes vol.1, 323
RED-EYED GREENLET [RED-EYED VIREO] Vireosylvia olivaceus [Vireo olivaceus]	specimens and notes vol.1, 365-366
NORTHERN WAXWING; BOHEMIAN CHATTERER Ampelis garrulus [Bombycilla garrulus]	specimens and notes vol.1, 398-400
SOUTHERN WAXWING Ampelis cedrorum [Bombycilla cedrorum]	notes vol.1, 401-402
GREAT NORTHERN SHRIKE; BUTCHER BIRD Collurio borealis [Lanius excubitor]	specimens and notes vol.1, 416-418
MEALY or HOARY RED-POLL Aegiothus canescens [Carduelis hornemanni]	specimens and notes vol.1, 499-501
SNOW-BUNTING Plectrophanes nivalis [Plectrophenax nivalis]	specimens and notes vol.1, 513-515

LAPLAND LONGSPUR — specimens and notes
Plectrophanes lapponicus [Calcarius lapponicus] — vol.1, 516-518

SMITH'S BUNTING or LONGSPUR; PAINTED LONGSPUR — specimens and notes
Plectrophanes pictus [Calcarius pictus] — vol.1, 519

SAVANNA SPARROW — specimens and notes
Passerculus savanna var. alaudinus [Passerculus sandwichensis] — vol.1, 536-538

WESTERN WHITE-CROWNED SPARROW — notes
Zonotrichia leucophrys — vol.1, 572

AMERICAN TREE SPARROW — specimens and notes
Spizella monticola [Spinzella arborea] — vol.2, 4-5

FIELD SPARROW — notes
Spizella pusilla — vol.2, 5

CHIPPING SPARROW — specimens and notes
Spizella socialis [Spizella passerina] — vol.2, 8

CLAY-COLOURED SPARROW — specimens and notes
Spizella pallida — vol.2, 12-13

FOX-COLOURED SPARROW — specimens and notes
Passerella iliaca — vol.2, 52-53

SWAMP BLACKBIRD; REDWING BLACKBIRD — notes
Agelaius phoeniceus — vol.2, 161

RUSTY BLACKBIRD — specimens and notes
Scolecophagus ferrugineus [Euphagus carolinus] — vol.2, 205-206

AMERICAN RAVEN [COMMON RAVEN] — specimens and notes
Corvus corax var. carnivorus [Corvus corax] — vol.2, 235-242

CANADA JAY; WHISKEY-JACK; MOOSE-BIRD — specimens and notes
Perisoreus canadensis — vol.2, 299-300

EASTERN WOOD PEWEE — notes
Contopus virens — vol.2, 358

TRAILL'S FLYCATCHER — specimens and notes
Empidonax pusillus var. trailli [Empidonax traillii] — vol.2, 371

LEAST FLYCATCHER — notes
Empidonax minimus — vol.2, 374

BELTED KINGFISHER — specimens and notes
Ceryle alcyon — vol.2, 393-394

WHITE-BACKED or THREE-TOED WOODPECKER — specimens and notes
Picoides tridactylus var. americanus

<u>Picoides tridactylus</u> [subspecies any of three possibilities: <u>fasciatus</u>, <u>dorsalis</u> or <u>bacatus</u>]	vol.2, 534-535
FLICKER; YELLOW-SHAFTED WOODPECKER [NORTHERN FLICKER]	notes
<u>Colaptes auratus</u>	vol.2, 576
MARSH OWL; SHORT-EARED OWL	notes
<u>Otus</u> (<u>Brachyotus</u>) <u>brachyotus</u> [<u>Asio flammeus</u>]	vol.3, 25
GREAT GREY OWL	specimens and notes
<u>Syrnium</u> (<u>Scotiaptex</u>) <u>cinereum</u> [<u>Strix nebulosa</u>]	vol.3, 30-33
AMERICAN SPARROW OWL; RICHARDSON'S OWL [BOREAL OWL]	specimens and notes
<u>Nyctale tengmalmi var. richardsoni</u> [<u>Aegolius funereus</u>]	vol.3, 42
KENNICOTT'S OWL	specimens and notes
<u>Scops asio var. kennicotti</u> [<u>Otus asio kennicottii</u>]	vol.3, 55
HORNED OWL	specimens and notes
<u>Bubo virginianus var. pacificus</u> [<u>Bubo virginianus</u>]	vol.3, 65-67
AMERICAN SNOWY OWL	specimens and notes
<u>Nyctea scandiaca var. arctica</u> [<u>Nyctea scandiaca</u>]	vol.3, 70-73
AMERICAN HAWK OWL	specimens and notes
<u>Surnia ulula var. hudsonia</u> [<u>Surnia ulula</u>]	vol.3, 77-79
WHITE GERFALCON [GRYFALCON]	specimens and notes
<u>Falco</u> (<u>Hierofalco</u>) <u>gyrfalco var. canadicans</u> [<u>Falco rusticolus</u>]	vol.3, 112
MACFARLANE'S GERFALCON [GRYFALCON]	specimens and notes
<u>Falco gyrfalco var. sacer</u> [<u>Falco rusticolus</u>]	vol.3, 115
BLACK GERFALCON [GRYFALCON]	specimens and notes
<u>Falco gyrfalco var. labradora</u> [<u>Falco rusticolus</u>]	vol.3, 120
AMERICAN PEREGRINE FALCON; DUCK HAWK	specimens and notes
<u>Falco communis var. anatum</u> [<u>Falco peregrinus anatum</u>]	vol.3, 132
BLACK PEREGRINE FALCON	specimens and notes
<u>Falco gyrfalco var. pealei</u> [<u>Falco peregrinus pealei</u>]	vol.3, 139-141
RICHARDSON'S MERLIN	specimens and notes
<u>Falco gyrfalco var. richardsoni</u> [<u>Falco columbarius richardsonii</u>]	vol.3, 150-153
AMERICAN OSPREY; FISH HAWK	specimens and notes
<u>Pandion haliaetus var. carolinensis</u> [<u>Pandion haliaetus</u>]	vol.3, 187
MARSH HAWK [NORTHERN HARRIER]	notes
<u>Circus cyaneus var. hudsonius</u> [<u>Circus cyaneus</u>]	vol.3, 216-220
SHARP-SHINNED HAWK	specimens and notes
<u>Nisus fuscus</u> [<u>Accipiter striatus</u>]	vol.3, 226-229

BROAD-WINGED HAWK — specimen
Buteo pennsylvanicus [Buteo platypterus] — vol.3, 259

SWAINSON'S HAWK; BAIRD'S HAWK — specimen
Buteo swainsoni var. swainsoni [Buteo swainsoni] — vol.3, 264

ROUGH-LEGGED HAWK — specimens and notes
Archibuteo lagopus var. sancti-johannis [Buteo lagopus] — vol.3, 304-311

GOLDEN EAGLE; RING-TAILED EAGLE — specimens and notes
Aquila chrysaetus var. canadensis [Aquila chrysaetus] — vol.3, 318-320

BALD EAGLE; AMERICAN EAGLE — specimens and notes
Haliaetus leucocephalus [Haliaeetus leucocephalus] — vol.3, 329-334

SPRUCE PARTRIDGE; CANADA GROUSE — specimens and notes
Canace canadensis var. canadensis [Dendragapus canadensis] — vol.3, 416

SHARP-TAILED GROUSE — specimens and notes
Pedioecetes phasianellus var. phasianellus [Tympanuchus phasianellus] — vol.3, 434-435

PTARMIGAN — specimens and notes
Lagopus [?] (Lagopus lagopus) — vol.3, 459-461

ROCK PTARMIGAN — specimens and notes
Lagopus mutus var. rupestris [Lagopus mutus] — vol.3, 463

The Water Birds of North America

BLACK-BELLIED PLOVER — specimens and notes
Squatarola helvetica [Squatarola squatarola] — vol.1, 136-137

AMERICAN GOLDEN PLOVER [LESSER GOLDEN PLOVER] — specimens and notes
Charadrius dominicus [Pluvialis dominica] — vol.1, 143

SEMIPALMATED RING PLOVER — specimens and notes
Aegialitis semipalmata [Charadrius semipalmatus] — vol.1, 155

AMERICAN OR WILSON'S SNIPE [COMMON SNIPE] — notes
Gallinago wilsoni [Gallinago gallinago] — vol.1, 189-192

GRAY SNIPE [no current correlation found] — specimens and notes
Macrorhamphus griseus [?] — vol.1, 199

STILT SANDPIPER — specimens and notes
Micropalama himantopus [Calidris himantopus] — vol.1, 204

SEMIPALMATED SANDPIPER — specimens and notes
Ereunetes pusillus occidentalis [Ereunetes pusillus] — vol.1, 209-210

BONAPARTE'S SANDPIPER [no discernable correlation with A.O.U. Checklist, 1983]	specimen and notes
<u>Actodromas</u> <u>fuscicollis</u>	vol.1, 229
HUDSONIAN GODWIT	specimen and notes
<u>Limosa</u> <u>haemastica</u>	vol.1, 261-263
YELLOW LEGS [LESSER YELLOW LEGS]	specimens and notes
<u>Totanus</u> <u>flavipes</u> [<u>Tringa</u> <u>flavipes</u>]	vol.1, 275-277
SPOTTED SANDPIPER	notes
<u>Tringoides</u> <u>macularius</u> [<u>Actitis</u> <u>macularia</u>]	vol.1, 303
BUFF-BREASTED SANDPIPER	specimens and notes
<u>Tryngites</u> <u>rufescens</u> [<u>Tryngites</u> <u>subruficollis</u>]	vol.1, 308
HUDSONIAN CURLEW [could be either the ESKIMO CURLEW or the WHIMBREL]	specimens and eggs
<u>Numenius</u> <u>hudsonicus</u> [<u>Numenius</u> <u>borealis</u> or <u>Numenius</u> <u>phalopus</u> <u>hudsonicus</u>]	<u>vol.1, 317-318</u>
RED PHALAROPE	specimens and notes
<u>Phalaropus</u> <u>fulicarius</u> [<u>Phalaropus</u> <u>fulicaria</u>]	vol.1, 329-330
NORTHERN PHALAROPE [RED-NECKED PHALAROPE]	specimens and notes
<u>Lobipes</u> <u>lobatus</u>	vol.1, 335
WHOOPING CRANE	specimens and notes
<u>Grus</u> <u>americana</u>	vol.1, 407
LITTLE BROWN CRANE [SANDHILL CRANE]	specimens and notes
<u>Grus</u> <u>canadensis</u>	vol.1, 412-413
WHISTLING SWAN [TUNDRA SWAN]	specimens and notes
<u>Olor</u> <u>columbianus</u> [<u>Cygnus</u> <u>columbianus</u>]	vol.1, 426-430
TRUMPETER SWAN	specimens and notes
<u>Olor</u> <u>buccinator</u> [<u>Cygnus</u> <u>buccinator</u>]	vol.1, 433
SNOW GOOSE	specimens and notes
<u>Chen</u> <u>hyperboreus</u> [<u>Chen</u> <u>hyperborea</u>]	vol.1, 441-444
ROSS' SNOW GOOSE [ROSS' GOOSE]	specimens and notes
<u>Chen</u> <u>rossi</u> [<u>Chen</u> <u>rossii</u>]	vol.1, 445-446
EUROPEAN WHITE-FRONTED GOOSE	notes
<u>Anser</u> <u>albifrons</u>	vol.1, 452-453
CANADA GOOSE	notes
<u>Bernicla</u> <u>canadensis</u> [<u>Branta</u> <u>canadensis</u> <u>canadensis</u>]	vol.1, 460-464
CANADA GOOSE	specimens and notes
<u>Bernicla</u> <u>hutchinsi</u> [<u>Branta</u> <u>canadensis</u> <u>hutchinsii</u>]	vol.1, 464-466
BLACK BRANT [BRANT]	specimens and notes

__Bernicla__ __nigricans__ [__Branta__ __bernicla__ __nigricans__] vol.1, 474

THE MALLARD notes
__Anas__ __boschas__ [__Anas__ __platyrhynchos__] vol.1, 498

THE GADWELL; GRAY DUCK specimens and notes
__Chaulelasmus__ __streperus__ [__Anas__ __strepera__] vol.1, 510-513

PINTAIL; SPRIG-TAIL DUCK [NORTHERN PINTAIL] notes
__Dafila__ __acuta__ [__Anas__ __acuta__] vol.1, 513-516

AMERICAN WIDGEON; BALD-PATE notes
__Mareca__ __americana__ [__Anas__ __americana__] vol.1, 523-524

SHOVELLER; SPOON BILL DUCK [NORTHERN SHOVELLER] specimens and notes
__Spatula__ __clypeata__ [__Anas__ __clypeata__] vol.1, 530

BLUE-WINGED TEAL notes
__Querquedula__ __discors__ [__Anas__ __discours__] vol.1, 532

AMERICAN GREEN-WINGED TEAL notes
__Nettion__ __carolinensis__ [__Anas__ __crecca__ __carolinensis__] vol.2, 7

SCAUP DUCK; BIG, BLACK-HEADED or BLUE BILL [GREATER SCAUP DUCK] specimens and notes
__Fulix__ __marila__ [__Aytha__ __marila__] vol.2, 21

LESS SCAUP DUCK; LITTLE BLACK-HEAD or BLUE BILL [LESSER SCAUP] specimens and notes
__Fulix__ __affinis__ [__Aythya__ __affinis__] vol.2, 23-25

CANVAS BACK DUCK specimens and notes
__Aethyia__ __vallisneria__ [__Aythya__ __valisineria__] vol.2, 35

BUFFLE=HEADED DUCK; BUTTER BALL specimens and notes
__Clangula__ __albeola__ [__Bucephala__ __albeola__] vol.2, 50-51

HARLEQUIN DUCK specimens and notes
__Histrionicus__ __minutus__ [__Histrionicus__ __histrionicus__] vol.2, 54

LONG-TAILED DUCK; OLD SQUAW notes
__Harelda__ __hymenalis__ [__Clangula__ __hymenalis__] vol.2, 60-62

PACIFIC EIDER [COMMON EIDER] specimens and notes
__Somateria__ __v-nigrum__ [__Somateria__ __mollissima__ __v-nigra__] vol.2, 82-83

KING EIDER notes
__Somateria__ __spectabilis__ vol.2, 86-87

VELVET SCOTER [WHITE-WINGED SCOTER] specimens and notes
__Melanetta__ __velvetina__ [__Melanitta__ __fusca__] vol.2, 96-97

?
in 5201
SURF DUCK [SURF SCOTER] specimens and notes
__Pelionetta__ __perspicillata__ [__Melanitta__ __perspicillata__] vol.2, 102-103

GLAUCOUS GULL	specimens and notes
Larus glaucus [_Larus hyperboreus_]	vol.2, 241-215
WHITE-WINGED GULL	specimens
Larus leucopterus [possibly the same as above - _Larus hyperboreus_]	vol.2, 219
HERRING GULL	notes
Larus argentatus	vol.2, 239-240
CALIFORNIA GULL	specimens
Larus californicus	vol.2, 244
SHORT-BILLED GULL	specimens and notes
Larus brachyrhynchus [no correlation with A.O.U. Checklists, 1956 or 1983 found]	vol.2, 249
FRANKLIN'S ROSY GULL	specimens and notes
Larus franklini [_Larus pipixcan_]	vol.2, 260
BONAPARTE'S GULL	specimens and notes
Larus philadelphia	vol.2, 263-264
FORK-TAILED GULL [SABINE'S GULL]	specimens and notes
Xema sabini	vol.2, 272-273
CASPIAN TERN	specimens
Sterna caspia	vol.2, 283
FORSTER'S TERN	specimens and notes
Sterna forsteri	vol.2, 294-295
COMMON TERN	specimens and notes
Sterna hirundo	vol.2, 297-299
ARCTIC TERN	specimens and notes
Sterna paradisaea	vol.2, 302-303
POMARINE JAEGAR	specimens
Stercorarius pomarinus	vol.2, 333
PARASITIC JAEGAR; RICHARDSON'S JAEGAR	specimens and notes
Stercorarius parasiticus	vol.2, 337-338
ARCTIC JAEGAR; LONG-TAILED JAEGAR	specimens and notes
Stercorarius longicaudus	vol.2, 341-343
WESTERN GREBE	notes
Aechmophorus occidentalis	vol.2, 422
AMERICAN RED-NECKED GREBE	specimens and notes
Colymbus holboellii [_Podiceps grisegena_]	vol.2, 430
HORNED GREBE	specimens and notes

Appendix G

Collectors in HBC Territory south of Methy Portage

Year	Collector	Location
1857	Donald Gunn	Red River Settlement
1858	Donald Gunn	Red River Settlement
1859	Donald Gunn	Red River Settlement
	George Barnston	Michipicoten
1860	Donald Gunn	Red River Settlement
	W. Mactavish	Red River Settlement
	George Mactavish	shores of Hudson Bay
	J. Mackenzie	Moose Factory
	J.G. Swan	Ne-ah Bay, W.T.
1861	J.(a) Anderson	Gulf St. Lawrence
	Mr. Gladmon	Hudson's Bay
1862	George Barnston	Michipicoten
	J.G. Swan	Straits of Fuca
1863	Donald Gunn	Red River Settlement
	W. McMurray	Winnipeg River
	W. Mactavish	Red River Settlement
	R. Mackenzie	Lake Manitoba
	H. Mackenzie	Red River Settlement
	H. Connolly	Labrador
	R. Hamilton	through Barnston
	J.G. Swan	Puget Sound
1864	H. Connolly	Labrador
	B. Smith	Moose Factory
	J. Mackenzie	Moose Factory
	Donald Gunn	Red River Settlement
	W. Mactavish	Red River Settlement
	J.G. Swan	Puget Sound
1865	W.J. Christie	Fort Edmonton
	John McCauley	Fort Edmonton
	Donald Gunn	Red River Settlement
	W. Mactavish	Red River Settlement
	C. Rankin	Lake Superior
	J.G. Swan	Puget Sound
1866	H. Connolly	Labrador
	Donald Gunn	Red River Settlement
	D.A. Smith	Labrador

	J.G. Swan	Puget Sound
1867	J.G. Swan	Puget Sound
1868	Donald Gunn	Red River Settlement

Appendix H

The information upon which this table has been constructed has come from the Assistant Secretary's Report

Percentage of HBC Donors in the Smithsonian Program			
year	total # of private donors	# Rupert Land donors	% Rupert Land donors
1853	73	0	
1854	85	0	
1855	130	0	
1856	160	0	
1857	106	2	1.8
1858	89	1	1
1859	209	4	1.9
1860	287	21	7
1861	111	18	16
1862	99	4	4
1863	166	23	14
1864	113	3	2.6
1865	102	7	6.9
1866	168	13	7.7
1867	166	2	1.2
1868	190	5	2.6
1869	212	2	.9
1870	189	3	1.6
1871	196	1	.5
1872	205	0	

in the Smithsonian Annual Report.*

* See, SIAR, 1853, pp.55-57
1854, pp.42-46; 1855, pp.57-61; 1856, pp.63-68 and p.48; 1857, pp.50-54; 1859, pp.72-78; 1860, pp.77-85; 1861,

pp.64-67; 1862, pp.57-59; 1863, pp.58-61; 1864, pp.86-88; 1865, pp.86-88; 1866, pp.46-50; 1867, pp.72-76; 1868, pp55-59; 1869, pp.53-58; 1870, pp.47-51; 1871, pp.43-50, and 1872, pp.56-61. There was no data on any donations which might have been received prior to 1853.

BIBLIOGRAPHY

PRIMARY SOURCES

Hudson's Bay Company Archives. Provincial Archives of Manitoba.
Winnipeg, Manitoba.

Post Records: Journals. District Reports. Departmental Minutes of Council. Post Miscellaneous Records. Section B.

Arctic Expeditions, 1824-66. Section E.

Biographical Files.

Rare Book Collection.

Governor Simpson's Correspondence. Section D.

The Anderson Papers. Section E.

The McGowan Collection. Section E.

London Correspondence Books Outwards. Section A.

Provincial Archives of Manitoba. Winnipeg, Manitoba.

The Alexander Morris Papers.

The Archibald Papers.

The Donald Ross Collection.

The Charles Napier Bell Collection.

Smithsonian Institution Archives. Washington, D.C.

Correspondence Registers. Office of the Secretary, 1850-52. Record Unit 42.

Incoming Correspondence. Assistant Secretary, 1850-77. Record Unit 52.

Outgoing Correspondence. Assistant Secretary, 1850-77. Record Unit 53.

Correspondence Registers. Secretary and Assistant Secretary, 1854-1890. Record Unit 57.

Accession Records. United States National Museum, 1834-1958. Record Unit 6999T.

Collected Notes, Lists and Catalogues on Birds, 1839, 1849-51, 1855-1965. Record Unit 7215.

Edward Alexander Preble Papers. Record Unit 7252.

Joseph Henry Collection. Record Unit 7001.

Spencer F. Baird Papers, 1833-89. Record Unit 7002.

Robert Kennicott Papers, 1863-65. Record Unit 7072.

Roderick Ross MacFarlane Papers. Record Unit 7207.

Fielding B. Meek Papers. Record Unit 7062.

William H. Dall Papers. Record Unit 7073.

Western Union Telegraph Expedition. Record Unit 7213.

Records of the Taxidermist. Record Unit 210.

United States National Museum Permanent Administrative Files. Record Unit 192.

United States National Museum. Assistant Secretary in Charge of the Museum. Incoming Correspondence, 1860-1908. Record Unit 189.

Hudson's Bay Correspondence Collection.

CONTEMPORARY IMPRINTS

Agassiz, Louis. Lake Superior: Its Physical Character, Vegetation, and Animals. Compared with Those of Other and Similar Regions. With a Narrative of the Tour by J. Elliott Cabot, and Contributions by other Scientific Gentlemen. Boston: Gould, Kendall and Lincoln, 1850.

Back, George. Narrative of the Arctic Land Expedition to the Mouth of the Great Fish River, and Along the Shores of the Arctic Ocean. In the Years 1833, 1834, and 1835. London: John Murray, 1836.

Baird, Spencer Fullerton. _The Mammals of North America. The Descriptions of Species Based Chiefly on the Collections in the Museum of the Smithsonian Institution._ Natural Sciences in America. Edited by Keir B. Sterling. Philadelphia: J.B. Lippencott & Co., 1859; reprint ed., New York: Arno Press, 1974.

________. _Review of American Birds in the Museum of the Smithsonian Institution. Part I. North and Middle America._ Washington, D.C.: Smithsonian Institution Press, 1864-66.

Baird, S.F., John Cassin and George Lawrence. _The Birds of North America. The Descriptions of Species Based Chiefly on the Collections in the Museum of the Smithsonian Institution._ Natural Sciences in America. Edited by Keir B. Sterling. Philadelphia: J.B. Lippencott & Co., 1860; reprint ed., New York: Arno Press, 1974.

Baird, S.F., Thomas Brewer and Robert Ridgway. _The Water Birds of North America._ Natural Sciences in America. Edited by Keir B. Sterling. Boston: Little, Brown and Co., 1884; reprint ed., New York: Arno Press, 1974.

Baird, S.F., T.M. Brewer and R. Ridgway. _History Of North American Birds: Land Birds._ Three Volumes. First Published 1874. Boston: Little Brown & Co., 1905.

Barnston, George. "Remarks upon the Geographical Distribution of the Order _Ranunculaceae_, throughout the Bristish possessions of North America." _Canadian Naturalist and Geologist._ 2(1857):12-20.

________. "Remarks on the Geographical Distribution of Plants in the British possessions of North America." _Canadian Naturalist and Geologist._ 3(1858):26-32.

________. "Remarks on the Geographical Distribution of the _Cruciferae_, throughout the British possessions in North America." _Canadian Naturalist and Geologist._ 4(1859):1-12.

________. "Geographical Distribution of the Genus _Allium_ in British North America." _Canadian Naturalist and Geologist._ 4(1859):116-121.

________. "Abridged sketch of the life of Mr. David Douglas, Botanist, with a few details of his travels and discoveries." _Canadian Naturalist and Geologist._ 5(1860):120-132 and 267-278.

________. "Recollections of the Swans and Geese of Hudson's Bay." _Canadian Naturalist and Geologist._ 6(1861):337-344.

________. "Remarks on the Genus Lutra, and on the species inhabiting North America." Canadian Naturalist and Geologist. 8(1863).

________. "On a collection of Plants from British Columbia made by Mr. James Richardson, in the summer of 1874." Canadian Naturalist and Quarterly Journal. 8(1875):90-94.

Catlin, George. Letters and Notes on the Manners, Customs and Condition of the North American Indians. Written during eight years' travel amongst the wildest tribes of Indians in North America. In 1832, 33, 34, 35, 36, 37, 38 and 39. Two vols. London: Tosswill & Myers, 1841.

Cook, James. A Voyage to the Pacific Ocean. Undertaken by the Command of His Majesty, For Making Discoveries in the Northern Hemisphere to Determine the Position and Extent of the West Side of North America. Its Distance From Asia and the Practicability of a Northern Passage to Europe. Under Direction of Captain's Cook, Clerke and Gore. In His Majesty's Ships the 'Resolution' and 'Discovery.' In the years 1776, 1777, 78, 79 and 80. London: W. and A. Strahan, 1784.

Copies of Instructions to Franklin and the Search Parties Ordered by the House of Commons. Two vols. 13 April 1848.

Coues, Elliott. Key to North American Birds. Two Volumes. First Published, 1872. Boston: The Page Co. Pubs., 1903.

Cowie, Isaac. The Company of Adventurers. Toronto: William Briggs, 1913.

Dawson, S.J. Report on the Exploration of the Country Between Lake Superior and the Red River Settlement, Between the Latter Place and the Assiniboine and Saskatchewan. Toronto: John Lovell, Printer, 1859.

Dobbs, Arthur. An Account of the Countries adjoining to Hudson's Bay, in the North-West Part of America: Containing a Description of their Lakes and Rivers, the Nature of the Soil and Climates, and their Methods of Commerce &c., Shewing the Benefit to be made by settling Colonies, and opening a Trade in these Parts whereby the French will be deprived in a great Measure of their Traffick in Furs, and the Communication between Canada and Mississippi be cut off. London: J. Robinson, 1744.

Fitzgerald, James Edward. An Examination of the Charter and Proceedings of the Hudson's Bay Company with Reference to the Grant of Vancouver's Island. London: Trelawney Saunders, 1849.

Franklin, John. Narrative of a Journey to the Shores of the Polar Sea. In the Years 1819-20-21-22. Two vols. London: John Murray, 1823.

________. Narrative of a Second Expedition to the Shores of the Polar Sea. In the Years 1825, 1826 and 1827. Including an account of the Progress of a Detachment to the Eastward by John Richardson. London: John Murray, 1828.

Gunn, Donald. "Indian Remains near Red River Settlement, Hudson's Bay Territories." Smithsonian Insitution Annual Report. 1867:399-400.

________. "An egging exploration to Shoal Lake." Smithsonian Institution Annual Report. 1867:427-32.

Hardisty, William Lucas. "The Loucheux Indians." Smithsonian Institution Annual Report. 1866:311-19.

Hind, Henry Youle. Explorations in the Interior of the Labrador Pennisula. The Country of the Montagnais and Nasquapee Indians. Two Vols. London: Longman, Green, Longman, Roberts and Green, 1863.

Hind, H.Y. Canadian Red River and Assinniboine and Saskatchewan Expeditions. Narrative of the Canadian Red River Exploring Expedition of 1857 and of the Assinniboine and Saskatchewan Exploring Expedition of 1858. Two vols. London: Longman, Green, Longman and Roberts, 1860; reprint ed., New York: Greenwood Press Pubs., 1969.

Jones, Strachan. "The Kutchin (Indian) Tribes." Smithsonian Institution Annual Report. 1866:320-27.

Kane, Paul. Wanderings of an Artist among the Indians of North America. From Canada To Vancouver's Island and Oregon Through the Hudson's Bay Company's Territory and Back Again. London: Longman, Brown, Green, Longman, and Roberts, 1859.

Lockhart, James. "Notes on the Habits of the Moose in the Far North of British America in 1865." Proceedings of the United States National Museum. 13(1890):305-308.

McClintock, F.L. The Voyage of the 'Fox' in the Arctic Seas. A Narrative of the Discovery of the Fate of Sir John Franklin and His Companions. London: John Murray, 1859.

McDonald, Archibald. Peace River. A Canoe Voyage from Hudson's Bay to Pacific. By the Late Sir George Simpson in 1828. edited with notes by Malcolm McLeod. Ottawa: J. Durie & Co., 1872.

MacFarlane, Roderick Ross. "On an Expedition down the Beghula or Anderson River." The Canadian Record of Science. 4(1890):28-53.

________. "Land and Sea Birds nesting within the Arctic Circle in the Lower Mackenzie District." The Historical and Scientific Society of Manitoba Transactions.39(1890).

________. "Notes on and List of Birds and Eggs collected in Arctic America, 1861-1866." [Reprint of article published by the Historical and Scientific Society of Manitoba] Proceedings of the United States National Museum. 14(1891):413-466.

________. "Notes on Mammals collected and observed in the northern Mackenzie River District, North-West Territories of Canada, with Remarks on Explorers and Explorations of the Far North." Proceedings of the United States National Museum. 28(1905):673-764.

Pennant, Thomas. Arctic Zoology. Two vols. Natural Sciences in America. ed., Keir B. Sterling. 1771; reprint ed., New York: Arno Press, 1974.

Preble, Edward A. "A Biological Investigation of the Hudson Bay Region." North American Fauna. no.22. Division of Biological Survey. United States Department of Agriculture. Washington: Government Printing Office, 1902.

________. "A Biological Investigation of the Athabaska-Mackenzie Region." North American Fauna. no.27. Bureau of Biological Survey. United States Department of Agriculture. Washington: Government Printing Office, 1908.

Rae, John. Narrative of an Expedition to the Shores of the Arctic Sea. In 1846 and 1847. London: T. & W. Boone, 1850.

Reports of Explorations and Surveys to Ascertain the Most Practicable and Economic Route for a Railroad from the Mississippi River to the Pacific Ocean. Made under the Direction of the Secretary of War, in 1853-4. According to the Acts of Congress of March 3, 1853, May 31, 1854 and August 5, 1855. Washington: A.O.P. Nicolson Printer, 1855.

Rhees, William J. ed. The Smithsonian Institution: Journals of the Board of Regents. Reports of Committees. Statistics. etc. Smithsonian Miscellaneous Collections. 329. Washington: Smithsonian Institution Press, 1879.

________. The Smithsonian Institution: Documents Relative to its Origin and History, 1835-1899. Smithsonian Miscellaneous Collections. vol. 42. Washington: Smithsonian Institution Press, 1901.

Richardson, John.; Swainson, William,; and Kirby, William. Fauna Boreali-Americana. Or, the Zoology of the Northern Parts of British America. Containing Descriptions of the Objects of Natural History Collected on the Late Northern Land Expeditions. Under Command of Captain Sir John Franklin. London: John Murray, 1829-36.

Ross, Bernard Rogan. "On the Indian Tribes of McKenzie River District and the Arctic Coast." Canadian Naturalist and Geologist. 4(1859):190-95.

________. "A Popular Treatise on the Fur-bearing Animals of the Mackenzie River District." Canadian Naturalist and Geologist. 6(1861):5-36.

________. "An Account of the Animals Useful in an Economic Point of view to the various Chipewyan Tribes." Canadian Naturalist and Geologist. 6(1861):433-41.

________. "List of Species of Mammals and Birds - collected in Mackenzie's River District during 1860-61." Canadian Naturalist and Geologist. 6(1861):441-44.

________. "An Account of the Botanical and Mineral products, useful to the Chipewyan tribes of Indians, inhabiting the Mackenzie River District." Canadian Naturalist and Geologist. 7(1862):133-37.

________. "List of Mammals, Birds, and Eggs, observed in the McKenzie's River District, with Notices." Canadian Naturalist and Geologist. 7(1862):137-155.

________. "On the Mammals, Birds, etc., of the Mackenzie River District." Natural History Review. A Quarterly Journal of Biological Science. 7(1862):269-90.

________. "The Eastern Tinneh." Smithsonian Institution Annual Report. 1866:304-311.

Ross, John. A Voyage of Discovery Made Under the Order of the Admiralty in His Majesty's Ships 'Isabella' and 'Alexander.' For the Purpose of Exploring Baffin's Bay, and Inquiring into the Probability of a North-West Passage. London: John Murray, 1819.

Simpson, George. Narrative of a Journey Round the World. During the Years 1841 and 1842. Two vols. London: Henry Colburn, 1847.

Simpson, Thomas. Narrative of the Discoveries on the North Coast of America Effected by the Officers of the Hudson's Bay Company During the Years 1836-39. London: Richard Bentley, 1843.

Smithsonian Institution Annual Report. 1847-1890.

Smithsonian Miscellaneous Collection.

Smithsonian Contributions to Knowledge.

Synopsis of the Contents of the British Museum. Fifth Ed. London: Cox and Baylis, 1812.

Vancouver, George. A Voyage of Discovery to the North Pacific Ocean and Round the World. In which the Coast of North-West America has been carefully examined and accurately surveyed. Undertaken by His Majesty's Command, Principally with a view to Ascertain the Existence of any Navigable Communication Between the North Pacific and North Atlantic Oceans. and Performed in the years 1790, 1791, 1792, 1793, 1794 and 1795. In the 'Discovery' Sloop of War and Armed Tender 'Chatham.' Three vols. London, 1798.

SECONDARY SOURCES

GENERAL STUDIES

Armour, Leslie, and Elizabeth Trott. The Faces of Reason: An Essay on Philosophy and Culture in English Canada, 1850-1950. Waterloo, 1981.

Bartlett, Irving H. The American Mind in the Mid-Nineteenth Century. 2nd ed. The American Historical Series, 1982.

Beales, D. and Geoffrey Best, eds. History, Society and the Churches: Essays in Honour of Owen Chadwick. 1985.

Berman, Morris. The Reenchantment of the World. Toronto, New York: Bantam, 1984.

Birrell, A.J. "Photographic Resources" Urban History Review 1972 (2):11-13.

Briggs, Asa. The Age of Improvement, 1783-1867. London: Longmans, 1959.

Brinton, Crane. Ideas and Men: The Story of Western Thought. New York: Prentice-Hall, 1950.

Chadwick, Owen. The Secularization of the European Mind in the Nineteenth Century. Cambridge, 1975.

Clements, William M. Native American Folklore in Nineteenth-Century Periodicals. Swallow Press/Ohio University Press, 1986.

Cook, Ramsay. The Regenerators. Social Criticism in late Victorian English Canada. University of Toronto Press, 1985.

Daniells, Roy. "The Cultural History of Canada: Centennial Project 1982" Transactions of the Royal Society of Canada 1972,10:3-11.

Dictionary of Canadian Biography. Toronto: University of Toronto Press.

The Dictionary of National Biography. The Concise Dictionary. Part I. From the Beginnings to 1900. Oxford Univeristy Press, 1961.

Ekirch, Arthur Jr. The Idea of Progress in America. 1944.

Fisher, Robin and Hugh Johnston. Captain James Cook and His Times. Vancouver: Douglas and McIntyre, 1979.

Harrison, J.F.C. The Early Victorians: 1832-51. London: Weidenfeld and Nicolson, 1971.

Heyck, T.W. The Transformation of Intellectual Life in Victorian England. New York: St. Martin's Press, 1982.

Heyck, T.W. The Transformation of Intellectual Life in the Nineteenth Century. London, 1983.

Higham J. and P. Conkin, eds. New Directions in American Intellectual History. Baltimore, John Hopkins University Press, 1977.

Himmelfarb, Gertrude. Victorian Minds New York, 1970.

Hobsbaum, Eric. The Age of Capital, 1848-1875. New York: Charles Scribner's Sons, 1975.

Holbo, Paul S. Tarnished Expansion, The Alaska Scandal, the Press, and Congress, 1867-1871. Knoxville: University of Tennessee Press, 1983.

Houghton, W. The Victorian Frame of Mind, 1830-70. New Haven, 1957.

Hynes, Samuel. The Edwardian Turn of Mind. Princeton, 1968.

Kushner, Howard I. Conflict on the Northwest Coast, American Rivalry in the Pacific North West, 1790-1867. Contributions in American History. No.41. London: Greenwood Press, 1975.

Langer, William L. Political and Social Upheaval, 1832-1852. New York, Evanston, London: Harper & Row, 1969.

Loeb, Jacques. The Mechanistic Conception of Life. ed. Donald Fleming. Cambridge, Mass: Belknap Press of Harvard University Press, 1964.

MacIntyre, Alisdair. Secularization and Moral Change. London, 1967.

MacLaren, I.S. "The Aesthetic map of the North, 1845-1859." Arctic 1985,38(2):89-103.

McKillop, A.B. A Disciplined Intelligence: Critical Inquiry and Canadian Thought in the Victorian Era. Montreal, 1979.

Mandelbaum, Maurice. History, Man and Reason: A Study in Nineteenth Century Thought. Baltimore, 1971.

Marshall, P.J. and Glyndwr Williams. The Great Map of Mankind: British Perceptions of the World in the Age of Enlightenment. Toronto: J.M. Dent & Sons Ltd., 1982.

Page, Evelyn. American Genesis: Pre-Colonial Writing in the North. Boston: Gambit, 1973.

Persons, Stow. American Minds: A History of Ideas. New York: Holt, Rinehart & Winston, 1958.

Persons, Stow. (Ed.) Evolutionary Thought in America. New York: George Braziller, 1956.

Purcell, Edward A. Jr. The Crisis of Democratic Theory: Scientific Naturalism and the Problem of Value. The University Press of Kentucky, 1973.

Stannard, David E. The Puritan Way of Death: A Study of Religion, Culture and Social Change. New York, 1977.

Service, Elman. A Century of Controversy. Ethnological Issues from 1860 to 1960. Orlando; San Diego; New York; London; Toronto; Montreal; Sydney; Tokyo: Academic Press, 1985.

Stannard, David E. Shrinking History: On Freud and the Failure of Psychohistory. New York: Oxford University Press, 1980.

Sweet, Louise. "What is Canadian Anthropology?" American Anthropologist.1978.

Symondson, Anthony. Victorian Crisis of Faith. London, 1970.

Thomas, Lewis H. "The Mid-Nineteenth Century Debate on the Future of the Northwest." In Documentary Problems in Canadian History. Vol.1. Edited by J.M. Bumsted. Georgetown, Ontario: Irwin-Dorsey Ltd., 1969.

Viera-Gallo, Jose-Antonio. "Documentation and the Democratization of Information." International Social Science Journal. 1982,34(4):737-46.

Wallace, Hugh N. The Navy, The Company and Richard King. British Exploration in the Canadian Arctic, 1829-1860. Montreal: McGill-Queen's University Press, 1980.

Wiener, Philip P. Dictionary of the History of Ideas. New York: Charles Scribner's Sons, 1973.

Williams, Raymond. Culture and Society: 1780-1850. 1958. Reprint, Harmondsworth: Penguin, 1961.

Wright, Allen A. Prelude to Bonanza: The Discovery and Exploration of the Yukon. Sidney, B.C.: Gray's Pub.,1976.

Zaslow, Morris. Reading the Rocks. The Story of the Geological Survey of Canada. Toronto: The Macmillan Co. of Canada Ltd., 1975.

FUR TRADE AND NATIVE HISTORY

Abbott, Donald N., ed. The World is as Sharp as a Knife: An Anthology in Honour of Wilson Duff Victoria: British Columbia Provincial Museum, 1981.

Ames, Michael. Museum anthropologists and the arts of acculturation on the Northwest Coast. BC Studies 49:3-14.

Ames, Michael. "Bill Holm, Willie Seaweed and the Problem of Northwest Coast Indian 'Art': A Review Article" BC Studies 64:74-81

Axtell, James. The European and the Indian: Essays in the Ethnohistory of Colonial North America. New York: Oxford University Press, 1981.

Baillie, James L. Jr. "Naturalists on Hudson Bay." The Beaver. December 1946, Pp.36-39.

Berkhofer, Robert F. Jr. The White Man's Indian: Images of the American Indian from Columbus to the Present. New York: Alfred A. Knopf, 1978.

Bibeau, Donald F. "Fur Trade Literature from a Tribal Point of View: A Critique" pp. 83-92 in Selected Papers of the Fourth North American Fur Trade Conference, 1981. Thomas C. Buckley, ed. St. Paul: Minnesota Historical Society, 1984.

Birket-Smith, Kaj. "Contributions to Chipewyan Ethnology." Report of the Fifth Thule Expedition 6(3):1-114.

Blackman, Margaret B. "Totems to Tombstones: Culture Change as Viewed through the Haida Mortuary Complex, 1877-1971." Ethnology. 1973, 12:47-56.

Bolus, Malvina, ed. People and Pelts: Selected Papers of the Second North American Fur Trade Conference. Winnipeg: Pequis Publishers, 1972.

Bowden, Henry Warner. American Indians and Christian Missions: Studies in Cultural Conflict. Chicago: University of Chicago Press, 1981.

Bradley, Ian, and Patrica Bradley. A Bibliography of Canadian Native Arts: Indian and Eskimo Arts, Crafts, Dance and Music. Victoria: GLC Publications, 1977.

Brasser, Ted J. Bo'jou, Neejee! Profiles of Canadian Indian Art. Ottawa: National Museums of Canada, 1976.

Brown, Jennifer S.H. Strangers in Blood: Fur Trade Company Families in Indian Country. Vancouver: University of British Columbia Press, 1980.

Buckley, Thomas C., ed. Rendezvous: Selected Papers of the Fourth North American Fur Trade Conference, 1981. St. Paul: Minnesota Historical Society, 1984.

Brumbach, Hetty Jo, Robert Jarvenpa, and Clifford Buell. "An Ethnoarchaeological Approach to Chipewyan Adaptations in the Late Fur trade Period." Arctic Anthropology 1982, 19(1):1-50.

Burpee, Lawrence J. ed. Journals and Letters of Pierre Gaultier de Varennes de la Verendrye and his sons. With an Introduction by Burpee. Vol.16. Toronto: The Champlain Society, 1927.

Camsell, Charles. Son of the North. Toronto: The Ryerson Press, 1954.

Canada House Cultural Centre Gallery Mohawk, Micmac, Maliseet and Other Indian Souvenir Art from Victorian Canada London: Canada House Cultural Centre Gallery, 1985.

Carlson, Roy L., ed. Indian Art Traditions of the Northwest Coast. Burnaby, B.C.: Simon Fraser University Press, 1983.

Chalmers, John W. "Missions and Schools in the Athabasca." Alberta History. 1983, 31(1):24-29.

Clark, Annette McFadyen, ed. Proceedings: Northern Athapaskan Conference 1971. Canada, National Museum of Man, Mercury Series. Ethnology Service Paper 27. Ottawa: National Museums of Canada, 1975.

Coates, Kenneth. "Furs Along the Yukon: Hudson's Bay Company-Native Trade in the Yukon River Basin, 1830-1893." BC Studies 1982, 55:50-78.

Coates, Kenneth. Canada's Colonies: A History of the Yukon and Northwest Territories. 1985.

Coates, Kenneth. "Protecting the Monopoly: The Hudson's Bay Company and Contemporary Knowledge of the Far Northwest 1830-1869. Yukon Historical and Museum Association Proceedings. 1984, 2:3-12.

Cole, Douglas. "Tricks of the Trade: Northwest Coast Artifact Collecting, 1875-1925." Canadian Historical Review 1982, 63:439-60.

Cole, Douglas. Captured Heritage: The Scramble for Northwest Coast Artifacts. Vancouver and London: Douglas and McIntyre, 1985.

Collins, Henry B., Frederica DeLaguna, Edmund Carpenter, and Peter Stone. The Far North: 2000 Years of American Eskimo and Indian Art. Washington: National Gallery of Art, 1973; reprint ed., Indiana University Press, 1977).

Cooke, Alan, and Clive Holland. The Exploration of Northern Canada, 500 to 1920: A Chronology. Toronto: Arctic History Press, 1978.

Crowe, Keith J. A History of the Original Peoples of Northern Canada. Arctic Institute of North America. Montreal: McGill-Queens University Press, 1974.

Cruikshank, Julie. "Becoming a Woman in Athapaskan Society: Changing Traditions on the Upper Yukon River." Western Canadian Journal of Anthropology. 1975, 5(2):1-14.

Damas, David, ed. Handbook of North American Indians. Vol.5: Arctic. William C. Sturtevant, gen. ed. Washington, D.C.: Smithsonian Institution, 1985.

Davis, Robert. Native Arts of the Pacific Northwest from the Rasmussen Collection of the Portland Art Museum. Stanford: Stanford University Press, 1949.

Duffek, Karen. "'Authenticity' and the Contemporary Northwest Coast Indian Art Market." BC Studies 1983, 57:99-111.

Duncan, Kate. Bead Embroidery, the Art of the Northern Athapaskans. Seattle: University of Washington Press, in press.

Ewers, John C. "Plains Indian Artists and Anthropologists: A Fruitful Collaberation." American Indian Art Magazine 1983b, 9(1):36-49.

Fast, Vera. The Protestant Missionary and Fur Trade Society: Initial Contact in Hudson's Bay Territory, 1820-1850. Ph.D. 1983 University of Manitoba.

Fisher, Robin. Contact and Conflict: Indian-European Relations in British Columbia, 1774-1890. Vancouver: University of British Columbia Press, 1977.

Francis, Daniel, and Toby Morantz. Partners in Furs: A History of the Fur Trade in Eastern James Bay, 1600-1870. Kingston and Montreal: McGill-Queen's University Press, 1983.

Gadacz, Rene R., and Michael I. Asch. "Thesis and Dissertation Titles and Abstracts on the Anthropology of Canadian Indians, Inuit and Metis from Canadian Universities. Report 1, 1970-82. Canada. National Museum of Man, Mercury Series, Ethnology Service Paper 95. Ottawa, 1984.

Gardner, Peter M. "Birds, Words and Requiem for the Omniscient Informant." American Ethnologist. 1976, 3:446-68.

Gibson, J.R. "Russian Sources for the Ethnohistory of the Pacific Coast of North America in the 18th and 19th Centuries." Western Canadian Journal of Anthropology. 1976, 6:91-115.

Gough, Barry M. "Official Uses of Violence Against Northwest Coast Indians in Colonial British Columbia." pp. 43-69 in Pacific Northwest Themes: Historical Essays in Honor of Keith A. Murray. James W. Scott, ed. Bellingham, wash.: Center for Pacific Northwest Studies, 1978.

Graburn, Nelson H.H., and Stephen Strong. Circumpolar Peoples: An Anthropological Perspective. Pacific Palisades, Calif.: Goodyear Publishing Co., 1973.

Graburn, Nelson H.H. "Inuit pivalliajut: The Cultural and Identity Consequences of the Commercialization of Canadian Inuit Art." pp. 185-200 in Consequences of Economic Change in Circumpolar Regions. L. Muller-Wille, P.J. Pelto, and R. Darnell, eds. University of Alberta, Boreal Institute for Northern Studies Occasional Paper 4. Edmonton, 1978.

Grant, John Webster. "Missionaries and Messiahs in the Northwest" Studies in Religion. 1980, 9(2):125-36.

Grant, John Webster. Moon of Wintertime: Missionaries and the Indians of Canada in Encounter since 1534. Toronto: University of Toronto Press, 1984.

Grumet, Robert S. Native Americans of the Northwest Coast: A Critical Bibliography Bloomington: Indiana University Press, 1979.

Grumet, Robert. "Managing the Fur Trade: The Coast Tsimshian to 1862." pp.26-39 in 1981 Proceedings of the American Ethnological Society. 1984.

Gualtieri, Antonio R. "Canadian Missionary Perceptions of Indian and Inuit Culture and Religious Tradition." Studies in Religion. 1980, 9(3):299-314.

Gunter, Erna. Indian Life on the Northwest Coast of North America as Seen by the Early Explorers and Fur Traders During the Last Decades of the Eighteenth Century. Chicago and London: University of Chicago Press, 1972.

Helm, June, and Eleanor B. Leacock. "The Hunting Tribes of Sub-Arctic Canada." pp. 343-74 in North American Indians in Historical Perrspective. E.B. Leacock and N.O. Lurie, eds. New York: Random House, 1971.

Helm, Juneb, Terry Alliband, Terry Birk, et al. "The Contact History of the Sub-Arctic Athapaskans: An Overview." pp. 302-46 in Vol.1 of Proceedings: Northern Athapaskan Conference, 1971, vol.1. A. McFadyen Clark, ed. 2 vols. Canada. National Museum of Man, Mercury Series, Ethnology Service Paper 27. Ottawa, 1975.

Helm, June. The Indians of the Sub-Arctic. A Critical Bibliography. Bloomington: Indiana University Press, 1979.

Helm, June, ed. Handbook of North American Indians, Vol.6: Sub-Arctic. William C. Sturtevant, gen. ed. Washington, D.C.: Smithsonian Institution, 1981.

Helm, June, and Royce Kurtz. Sub-Arctic Athapaskan Bibliography-1984. Iowa City: Department of Anthropology, University of Iowa, 1984.

Helmer, J.W., S. Van Dyke, and F.J. Kense, eds. Prehistory of the North American Sub-Arctic: The Athapaskan Question. Calgary: The Archaeological Association of the University of Calgary, 1977.

Honigmann, John J. "Formation of Mackenzie Delta Frontier Culture" pp. 185-92 in Pilot Not Commander: Essays in Memory of Diamond Jenness. Pat Lotz and Jim Lotz, eds. Anthropologica n.s. 13(1-2). Ottawa, 1971.

Innis, Harold A. The Fur Trade in Canada, revised ed. Toronto: University of Toronto Press, 1970.

Janes, Robert R. "Culture Contact in the 19th century Mackenzie Basin, Canada." Current Anthropology 1976, 17(2):344-45.

Janes, R.R. "The Athapaskan and the Fur Trade: Observations from Archaeology and Ethnohistory." Western Canadian Journal of Anthropology 1975, 5(3-4):159-86.

Janes, R.R., and T.C. Losey. "Recent Discoveries in Fur Trade Archaeology of Upper and Central Mackenzie River Regions." Canadian Archaeological Association Bulletin 1974, 6:93-120.

Jenness, Diamond. "Material Culture of the Copper Eskimos." Report of the Canadian Arctic Expedition 1913-18. Vol.16. Ottawa, 1946.

________. Indians of Canada. 7th ed. Toronto: University of Toronto Press, 1977.

Judd, Carol. "Employment Opportunities for Mixed Bloods in the Hudson's Bay Company to 1870." H.B.C.A., PAM, Pp.1979-21.

Karamanski, Theodore J. Fur Trade and Exploration: Opening the Far Northwest 1821-1852. Norman: University of Oklahoma Press, 1983.

Kehoe, Alice B. North American Indians: A Comprehensive Account. Englewood Cliffs, N.J.: Prentice-Hall, 1981.

Kellough, Gail. "From Colonialism to Economic Imperialism: The Experience of the Canadian Indian." pp.343-77 in Structured Inequality in Canada. John Harp and J.R. Hofley, eds. Scarborough, Ont.: Prentice-Hall of Canada, Ltd., 1980.

King, Jonathan C.H. Artificial Curiosities from the Northwest Coast of America. London: British Museum, 1981.

Krech, Shepard III. "Northern Athapaskan Ethnology: An Annotated Bibliography of Published Materials, 1970-79." Arctic Anthropology 1980, 17(2):68-105.

________. "Ethnohistory and Ethnography in the Sub-Arctic." American Anthropologist 1984, 86:80-86.

________. The Sub-Arctic Fur Trade: Native Social and Economic Adaptations. Vancouver: University of British Columbia Press, 1984.

________. Native Canadian Anthropology and History. A Selected Bibliography. Ed. J.S.H. Brown. Winnipeg, Manitoba: Rupert's Land Research Centre, 1986.

Lindsay, Debra. "The Hudson's Bay Company-Smithsonian Connection and Fur trade Intellectual Life: Bernard Rogan Ross, a Case Study." In Le Castor Fait Tout. Selected Papers of the Fifth North American Fur Trade Conference, 1985. Eds. Bruce Trigger, Toby Morantz and Louise Dechene. Montreal: Lake St. Louis Historical Society, 1987. Pp.587-617.

Low, Jean. "Dr. Charles Frederick Newcombe." The Beaver 1982, 312(4):32-39.

Macdonald, George F. "Cosmic Equations in Northwest Coast Indian Art." pp.225-38 in The World is as Sharp as a Knife. Donald N. Abbott, ed. Victoria: British Columbia Provincial Museum, 1981.

Mary-Rousseliere, Guy. "Exploration and Evangelization of the Great Canadian North: Vikings, Coureurs de Bois, and Missionaries." Arctic 1984, 37:590-602.

McClellan, Catharine. "Indian Stories About the First Whites in Northwestern America." Pp.103-33 in Ethnohistory in Southwestern Alaska and the Southern Yukon: Method and Content. Margaret Lantis, ed. Lexington: University Press of Kentucky, 1970.

McFeat, Tom, ed. Indians of the North Pacific Coast. Toronto: McClelland and Stewart, 1966.

Miller, Virginia P. "Silas Rand, 19th Century Anthropologist Among the Micmac." Anthropologica. 1980, 22:235-50.

Morice, Adrian G. "Notes Archaeological, Industrial, and Sociological on the Western Denes." Transactions of the Canadian Institute 1893, 4:1-222.

________. "The Great Dene Race." Anthropos 1906-10, 1:229-77, 483-508, 695-730; 2:1-34, 181-96; 4:582-606; 5:113-42, 419-43, 643-53, 969-90.

Morton, A.S. A History of the Canadian West to 1870-71. 2nd ed. Lewis G. Thomas ed. Toronto: University of Toronto Press, 1973.

Muise, D.A., ed. Approaches to Native History in Canada: Papers of a Conference Held at the National Museum of Man, October, 1975. Ottawa: National Museum of Man, 1977.

Newcomb, William W. North American Indians: An Anthropological Perspective. Pacific Palisades, Cal.: Goodyear Pub. Co., 1974.

Nicks, Trudy. The Creative Tradition: Indian handicrafts and Tourist Art. Edmonton: Provincial Museum of Alberta, 1982.

Nute, Grace Lee. "A Botanist at Fort Colvile." The Beaver. September 1946, Pp.28-31.

Oliver, E.H. Ed. The Canadian Norith-West. Its Early Development and Legislative Records. Two Vols. Ottawa: Government Printing Bureau, 1914.

Patterson, Nancy-Lou. Canadian Native Art. Don Mills: Collier MacMillan, 1973.

Peake, Frank A. "Fur Traders and Missionaries: Some Reflections on the Attitudes of the Hudson's Bay Company Towards Missionary Work Among the Indians." Western Canadian Journal of Anthropology 1972, 3(1):72-93.

Pearsall, Marion. "Contributions of Early Explorers and Traders to the Ethnography of the Northwest." Pacific Northwest Quarterly 1949, 40:316-26.

Pearsall, Marion. The Nootka Connection: Europe and the Northwest Coast 1790-1795. Vancouver: Douglas & MacIntyre, 1980.

Perry, Richard J. "The Fur Trade and the Status of Women in the Western Sub-Arctic." Ethnohistory 1979, 26:363-76.

Price, John A. Indians of Canada: Cultural Dynamics. Scarborough: Prentice-Hall of Canada, 1979.

Price, John A. "Historical Theory and the Applied Anthropology of U.S. and Canadian Indians." Human Organization 1982, 41:43-53.

Ray, Arthur J., and Arthur Roberts. "Approaches to the Ethnohistory of the sub-arctic." Ethnohistory 1985, 32:270-80.

Ray, Arthur J. "Competition and Conservation in the Early Sub-Arctic Fur Trade." Ethnohistory 1978, 25:347-58.

_________. "Fur Trade History as an Aspect of Native History." Pp. 7-19 in One Century Later, I.A.L. Getty and D.B. Smith, eds. Vancouver: University of British Columbia Press, 1978.

_________. Indians in the Fur Trade: Their Role as Hunters, Trappers and Middlemen in the Lands Southwest of Hudson Bay 1660-1870. Toronto: University of Toronto Press, 1974.

Ray, A.J., and Donald Freeman. "Give Us Good Measure": An Economic Analysis of Relations Between the Indians and the Hudson's Bay Company Before 1763. Toronto: University of Toronto Press, 1978.

Rich, E.E. Ed. James Isham's Observations on Hudsons Bay, 1743, and Notes and Observations on a Book Entitled: A Voyage to Hudsons Bay in the Dobbs Galley, 1749. Assisted by A.M. Johnson. Vol.12. Hudson's Bay Record Society. Toronto: The Champlain Society, 1949.

_________., Ed., John Rae's Correspondence with the Hudson's Bay Company on Arctic Exploration, 1844-1855. Assisted by A.M. Johnson. With an Introduction by J.M. Wordie and R.J. Cyriax. London: The Hudson's Bay Record Society, 1953.

_________. The History of the Hudson's Bay Company 1670-1870. 3 vols. London: Hudson's Bay Record Society, 1958-59.

_________. "Trade Habits and Economic Motivation Among the Indians of North America." Canadian Journal of Economics and Political Science 1960, 26:35-53.

_________. The Fur Trade and the Northwest to 1857. Toronto: McClelland and Stewart, 1967.

Ridington, Robin. "From Artifice to Artifact: Stages in the Industrialization of a Northern Hunting People." Journal of Canadian Studies 1983, 18:55-66.

Ronda, James P., and James Axtell. Indian Missions: A Critical Bibliography. Bloomington: Indiana University Press, 1978.

Savishinsky, Joel S. "Coping with Feuding: The Missionary, the Fur Trader, and the Ethnographer." Human Organization 1972, 31(3):281-90.

Savoie, Donat, ed. The Amerindians of the Canadian North-West in the 19th Century, as Seen by Emile Petitot. Vol.2: The Loucheux Indians. (MDRP 10) Ottawa: Department of Indian Affairs and Northern Development, Northern Science Research Group, 1971.

Siebert, Erna V. "Northern Athapaskan Collections of the First Half of the Nineteenth Century." Arctic Anthropology 1980, 17(1);49-60.

Sloan, William A. "The Native Response to the Extension of the European Traders into the Athabasca and Mackenzie Basins, 1770-1814" Canadian Historical Review 1979, 60:281-99.

Slobodin, Richard. "Canadian Sub-Arctic Athapaskans in the Literature to 1865." Canadian Review of Sociology and Anthropology. 12(3):278-89.

Smith, David M. "Cultural and Ecological Change: The Chipewyan of Fort Resolution." Arctic Anthropology 1976, 13(1):35-42.

Spry, Irene M. "The Transition from a Nomadic to a Settled Economy in Western Canada, 1856-96." Transactions of the Royal Society of Canada, 1968.

Stearns, R.P. "The Royal Society and the Company." The Beaver. June 1945, Pp.8-13.

Thomas, Greg. "The Smithsonian and the Hudson's Bay Company." Prairie Forum. 10(2)1985:283-306.

Thompson, Judy. "Preliminary Study of Traditional Kutchin Clothing in Museums." Canada. National Museum of Man. Ethnology Service Paper 1. Ottawa, 1972.

Trigger, Bruce G., Toby Morantz, and V. Stewart, eds. "Le Castor Fait Tout": Selected Papers of the Fifth North American Fur Trade Conference. Montreal, In Press.

Trigger, Bruce G. Natives and Newcomers: Canada's "Heroic Age" Reconsidered. Kingston and Montreal: McGill-Queen's University Press, 1985.

Tyrrell, J.B., Ed., Journals of Samuel Hearne and Philip Turnor. Reprint of Vol.21, Champlain Society Publications. New York: Greenwood Press Pubs., 1968.

Usher, Jean. "Apostles and Aborigines: The Social Theory of Church Missionary Society." Social History 1971, 7:28-52.

VanStone, James W. "Athapaskan Clothing and Related Objects in the Collections of the Field Museum of Natural History." Fieldiana: Anthropology 1981, n.s. 4.

Vaughan, Thomas, and Bill Holm. Soft Gold: The Fur Trade and Cultural Exchange on the Northwest Coast of America. Oregon Historical Society, 1982.

Williams, Glyndwr., Ed. Andrew Graham's Observations on Hudson's Bay, 1767-91. With an Introduction by Richard Glover. Vol.27. London: The Hudson's Bay Record Society, 1969.

Wyatt, Victoria. Shapes of their Thoughts: Reflections of Culture Contact in Northwest Coast Indian Art. Norman: University of Oklahoma Press, 1984.

Yerbury, J. Colin. "On Culture Contact in the Mackenzie Basin." Current Anthropology. 1977, 18:350-52.

Yerbury, J.C. "Further Notes on the Ethnohistory of the Mackenzie Basin" Current Anthropology 1978, 19:458-59.

Yerbury, J.C. The Sub-Arctic Indian and the Fur Trade, 1680-1860. Vancouver: University of British Columbia Press, 1985.

Zenner, Walter P., and Robert Jarvenpa. "Scots in the Northern Fur Trade: A Middleman Minority Perspective." Ethnic Groups 1980, 2:189-210.

HISTORY OF SCIENCE

Allen, David E. The Naturalist in Britain: A Social History. London: Allen Lane, 1976.

Badash, Lawrence. "The Completeness of Nineteenth-Century Science." Isis. 1972,63:48-58.

Barber, Bernard. "Resistance by scientists to scientific discovery." Science.1961,134:596-602.

Barnes, S.B., and S. Shapin, eds. Natural Order: Historical Studies of Scientific Culture. London: Sage, 1979.

Barnes, Barry, and David Edge, eds. Science in Context: Readings in the Sociology of Science. Milton Keynes: Open University Press, 1982.

Berger, C. Science, God and Nature in Victorian Canada. University of Toronto Press, 1983.

Berman, Morris. Social Change and Scientific Organization. The Royal Institution, 1799-1844. London: Heinemann, Ithaca: Cornell University Press, 1978.

Bernal, J.D. The Social Function of Science. Routledge and Kegan Paul, 1939. Reprint with a postscript, "After Twenty-five Years." Cambridge, Mass.: MIT Press, 1967.

Bielawski, E. "Anthropological Observations on Science in the North: The Role of the Scientist in Human Development in the NWT" Arctic 1984, 37(1):1-6.

Blake, R.M., C.J. Ducasse, and E.H. Madden. Theories of Scientific Method: The Renaissance Through the Nineteenth Century. Seattle: University of Washington Press, 1960.

Bowler, Peter J. Evolution. The History of an Idea. Berkley: University of California Press, 1984.

________. Fossils and Progress. Paleontology and the Idea of Progressive Evolution in the Nineteenth Century. New York: Science History, 1976.

Brannigan, Augustine. The Social Basis of Scientific Discoveries. Cambridge University Press, 1981.

________. Social Responses to Technological Change. Publisher here, 1985.

Brew, J.O., Ed. One Hundred Years of Anthropology. Cambridge: Harvard University Press, 1968.

Brooke, John H. "Natural Theology and the Plurality of Worlds: Observations on the Brewster-Whewell Debate." Annals of Sci. 1977,34:221-86.

________. "The Natural Theology of the Geologists: Some Theoretical Strata." in Jordanova, L.J., and Porter, R.S., eds. Images of the Earth: Essays in the History of the Environmental Sciences. Chalfont St. Giles, Bucks: British Society for the History of Science, 1979.

Bruce, Robert V. The Launching of Modern American Science, 1846-1876. The Civil War Centennial Commission Series. Ed. Harold M. Hyman. New York: Alfred A. Knopf Inc., 1987.

Burrow, John W. "Evolution and Anthropology in the 1860s: The Anthropological Society of London." Victorian Studies. 1963,7:137-54.

Burrow, John. Evolution and Society, A Study in Mid-Victorian Social Theory. Cambridge, 1966.

Cannon, Susan F. Science in Culture. The Early Victorian Period. New York: Science History, 1978.

Caswell, John E. U.S. Scientific Expeditions to the Arctic 1850-1909. Ph.D. 1952 Stanford University.

Cole, Douglas. "The Origin of Canadian Anthropology, 1850-1910." Jour. Can. Studies.1973,8:33-45.

Coleman, William. Victorian Science.1970.

________. Biology in the Nineteenth Century: Problems of Form, Function and Transformation. Cambridge University Press, 1977.

________. Studies in the History of Biology. Baltimore: John Hopkins University Press, 1977.

Dana, Edward Salisbury, et al. A Century of Science in America, With Special Reference to the American Journal of Science, 1818-1918. New Haven: Yale University Press, 1918.

Daniels, George., Ed. Nineteenth-Century American Science: A Reappraisal. 1972.

________. American Science in the Age of Jackson.1968

Deiss, William A. "Spencer F. Baird and his collectors." J.Soc. Biblphy. Nat. Hist.(1980)9(4):635-645.

________. "The Making of a Naturalist: Spencer F. Baird, The Early Years" in From Linnaeus to Darwin, Commentaries on the History of Biology and Geology. London: Society for the History of Natural History. 1985.

DeVecchi, Vittorio. Science and Government in Nineteenth Century Canada. Ph.D. 1978 University of Toronto.

Dictionary of Scientific Biography.

Dillenberger, John. Protestant Thought and Natural Science: A Historical Interpretation. London: Collins, 1961.

Dolphin, Warren D. "A Brief Critical Analysis of Scientific Creationism." In Did the Devil Make Darwin Do It? Modern Perspectives on the Creation-Evolution Controversy, Pp.19-36. Edited by David B. Wilson. Iowa State University Press, 1983.

Dupree, A. Hunter. Science in the Federal Government. A History of Policies and Activities to 1940. Cambridge: Harvard University Press, Belknap Press, 1957.

Durbin, Paul T. (Ed.) A Guide to the Culture of Science, Technology and Medicine. New York: The Free Press. A Division of Macmillan Pub. Co. Inc.,1980.

Eiseley, Loren. Darwin's Century: Evolution and the Men Who Discovered It. 1958. Reprint, New York: Doubleday Anchor Paperback, 1961.

Erickson, Paul A. "Nineteenth Century Physical Anthropology in Historical Perspective." Western Canadian Journal of Anthropology.1975,5,no.1.pages?

Farley, J. The Spontaneous Generation Controversy from Descartes to Oparin, Baltimore, John Hopkins University Press, 1977.

Farley, John. Gametes and Spores: Ideas About Sexual Reproduction, 1750-1914. Baltimore: John Hopkins University Press, 1982.

Fleck, Ludwik. Genesis and the Development of a Scientific Fact. Trans. Fred Bradley and Thaddeus J. Trenn. Chicago and London: University of Chicago Press, 1979.

Gaston, Jerry. The Reward System in Britain and American Science. Toronto: John Wiley and Sons, 1978.

Glass, Hiram Bentley. The Timely and the Timeless The Interrelationships of Science, Education and Society. New York: Basic Books, 1970.

Glass, H.B., Owsei Temkin, and William L. Strauss Jr., eds. Forerunners of Darwin 1745-1859. The John Hopkins Press, 1968.

Gillispie, Charles C. Genesis and Geology: The Impact of Scientific Discoveries Upon Religious Beliefs in the Decades before Darwin. Cambridge, Mass.: Harvard, 1951; also Harper Paperback, 1959.

Goldman, I. "Evolution and Anthropology." Victorian Studies. 1959-60,3:55-75.

Goetzmann, William H. Exploration and Empire, The Explorer and the Scientist in the Winning of the American West.1966.

________. "Paradigm Lost." In The Sciences in the American Context: New Perspectives, Pp.21-34. Edited by Nathan Reingold. Washington: Smithsonian Institution Press, 1979.

________. New Lands. New Men: America and the Second Great Age of Discovery. Penguin Books, 1987.

Gould, Stephen Jay. Ontogeny and Phylogeny. Cambridge: Harvard University Press, Belknap Press, 1977.

________. Ever Since Darwin. Burnett Books, 1978.

________. The Panda's Thumb. New York: Norton, 1980.

________. The Mismeasure of Man. New York: Norton, 1981.

________. Hen's Teeth and Horse's Toes. New York: Norton, 1983.

________. The Flamingo's Smile: Reflections in Natural History. New York: Norton, 1985.

Greene, John C. The Death of Adam: Evolution and Its Impact on Western Thought. Ames, Iowa, 1959; also Mentor paperback, 1961.

________. Science, Ideology and World View. University of California Press, 1981.

Greene, Mott T. Geology in the Nineteenth Century: Changing Views of a Changing World. Ithaca, New York: Cornell University Press, 1982.

Gunther, Albert E. A Century of Zoology at the British Museum. Through the Lives of Two Keepers, 1815-1914. Kent, England: William Dawson & Sons Ltd., Cannon House, 1975.

Hallowell, A. Irving. "The Beginnings of Anthropology in America." in Selected Papers from the American Anthropologist. Frederica de Laguna, ed., Evanston: Row, Peterson, 1960.

Haskell, Thomas. The Emergence of Professional Social Science: The American Social Science Association and the Nineteenth Century Crisis of Authority. Urbana, 1977.

Hays, J.N. "The London Lecturing Empire, 1800-1850." In Metropolis and Province. Studies in British Culture, 1780-1850. Ian Inkster and Jack Morrell. Eds. London: Hutchison, 1983.

Heppell, David. "The Evolution of the Code of Zoological Nomenclature." In History in the Service of Systematics. Edited by Alwyne Wheeler and James H. Price. London: Society for the Bibliography of Natural History, 1981.

Hinsley, Curtis M. Jr. Savages and Scientists. The Smithsonian Institution and the Development of American Anthropology, 1846-1910.1981.

Houghton, Walter, E., ed. The Wellesley Index to Victorian Periodicals, 1824-1900. London: Routledge and Kegan Paul, 1966-.

Houston, C. Stuart., Ed. Arctic Ordeal. The Journal of John Richardson, Surgeon-Naturalist with Franklin, 1820-1822. With a Forward by W. Gilles Ross. Kingston and Montreal: McGill-Queen's University Press, 1984.

Howard, Jonathan. Darwin Oxford University Press, 1982.

Howarth, O.J.R. The British Association for the Advancement of Science: A Retrospect, 1831-1931. 2nd ed. British Association, 1931.

Idiens, Dale. "The Athapaskan Indian Collections in the Royal Scottish Museum." In The Athapaskans: Strangers of the North. Ottawa: National Museum of Man, 1974.

James, James Alton., Ed. The First Scientific Exploration of Russian America and the Purchase of Alaska. Chicago: Northwestern University, 1942.

Jarrell, Richard A., and N.R. Ball, eds. Science, Technology, and Canadian History. Wilfrid Laurier University Press, 1980.

Jarrell, R.A. "The Social Function of the Scientific Society in Nineteenth Century Canada" in Critical Issues in the History of Canadian Science, Technology and Medicine. Jarrell and Arnold E. Roos, eds. Thornhill and Ottawa: HSTC Publications 1983.

Jensen, J.V. "The X Club: Fraternity of Victorian Scientists." Brit. J. Hist. Sci. 1970,5:63-72.

Jones, Bessie Zaban., ed. The Golden Age of Science: Thirty Portraits of the Giants of Nineteenth Century Science by their Scientific Contemporaries. Intro. by Everett Mendelsohn. New York: Simon and Schuster [in co-operation with the Smithsonian Institution], 1966.

Kargon, Robert H. Science in Victorian Manchester. Enterprise and Expertise. Baltimore and London: The John Hopkins University Press, 1977.

Kemper, Robert V. and John I.S. Phinney. The History of Anthropology. A Research Bibliography. New York: Garland, 1977.

Kline, David.."Theories, Facts and Gods: Philosophical Aspects of the Creation-Evolution Controversy." Pp.37-45 in Did the Devil Make Darwin Do It? D.B. Wilson ed. 1983.

Knaffla, L.A., M.S. Staum, and T.H.E. Travers, eds. Science, Technology, and Culture in Historical Perspective. Calgary, 1976.

Kohlstedt, Sally Gregory. The Formation of the American Scientific Community: The American Association for the Advancement of Science, 1848-1860. Urbana, 1976.

Kuper, Adam. "The Development of L.H. Morgan's Evolutionism." Journal of the History of the Behavioural Sciences 1985, 21(1):3-22.

Leith, Brian The Descent of Darwin. London: William Collins Sons & Co. Ltd., 1982.

Levere, Trevor H. and Richard A. Jarrell., Eds. A Curious Fieldbook. Science and Society in Canadian History. 1974.

Levere, T. "Science and the Canadian Arctic, 1818-76, From Sir John Ross to Sir George Strong Nares." Arctic vol.41, no.2(June 1988):127-137.

Livingstone, David N. "Natural Theology and Neo-Lamarckism: The Changing Context of Nineteenth Century Geography in the United States and Great Britain." Annals of the Association of American Geographers. 1984, 74(1):9-28.

Lovejoy, Arthur O. The Great Chain of Being: A Study of the History of an Idea. 1936. Reprint, New York: Harper Torchbooks, 1960.

Lurie, Edward. Nature and the American Mind: Louis Agassiz and the Culture of Science.1974.

Mayr, Ernst. Evolution and the Diversity of Life. Cambridge, Mass.: Harvard University Press, 1976.

Mayr, Ernst, and William B. Provine., Eds. The Evolutionary Synthesis and the Unification of Biology. Cambridge, Mass.: Harvard University Press, 1980.

Mayr, E. The Growth of Biological Thought: Diversity, Evolution, and Inheritance. Cambridge, Mass.: Belknap Press, 1982.

McCardle, Bennett. The Life and Anthropological Works of Daniel Wilson (1816-92). M.A. Thesis. 1980 University of Toronto.

McFeat, Tom. 300 years of Anthropology in Canada. Occasional Papers in Anthropology #7. St. Mary's University, Halifax, Department of Anthropology, 1980.

McIlwraith, T.F. "Sir Daniel Wilson: A Canadian Anthropologist of 100 years Ago." Transactions of the Royal Society of Canada. 1964, 2:129-136.

Meadows, A.J. (Ed.) Development of Science Publishing in Europe. Amsterdam, New York and Oxford: Elsevier, date?

Mendelsohn, Everett. Transformation and Tradition in Science. 1984.

Miller, Alden H. "Concepts and Problems of Avian Systematics in Relation to Evolutionary Processes." In Recent Studies in Avian Biology. Edited by Albert Wolfson. University of Illinois Press, 1955.

Miller, Howard S. Dollars for Research: Science and its Patrons in Nineteenth Century America. Seattle, Washington: 1970.

Miller, Lillian B., et al. The Lazzaroni. Science and Scientists in Mid-Nineteenth Century America. Smithsonian Institution Press, 1972.

Millhauser, Milton. Just Before Darwin: Robert Chambers and His Vestiges. Middletown, Ct., 1959.

Molella, Arthur P. "At the Edge of Science: Joseph Henry,'Visionary Theorizers' and the Smithsonian Institution." Annals of Science.[Great Britain] 1984,41(5):445-461.

________., Ed. Henry, Joseph. A Scientist in American Life: Essays and Lectures of Joseph Henry. Washington, Smithsonian Institution Press, 1980.

Morrell, Jack, and Arnold Thackray. Gentlemen of Science: Early Years of the British Association for the Advancement of Science. Oxford: Clarendon Press, 1981.

Morrell, Jack. Gentlemen of Science - Correspondence date?

Murra, John., Ed. American Anthropology: the early years. Proceedings of the American Ethnological Society, 1974. West Pub. Co., 1976.

Murray, Robert H. Science and Scientists in the Nineteenth Century. London: The Sheldon Press; Toronto: The Macmillan Co., 1925.

Nicolson, Marjorie. Science and Imagination. Hamden, Conn.: Archon Books, 1976.

Nicholson, Paul T. "Hodder Westropp: Nineteenth Century Archaeologist." Antiquity 1983, 57(221):205-210.

Oehser, Paul H. The Smithsonian Institution. New York: Praeger Pubs., 1970.

Orosz, Joel Jr. Curators and Culture: American Interpretive History of the Museum Movement in America, 1773-1870. Ph.D. 1986 Case Western Reserve University.

Ospovat, Dov. The Development of Darwin's Theory: Natural History, Natural Theology and Natural Selection, 1838-1859. Cambridge: Cambridge University Press, 1981.

Ouellet, Cyrias. The Sciences in French Canada. Quebec: Department of Cultural Affairs, 1967.

Painter, George. "James Smithson's Bequest to the United States: The Smithsonian Institution." American Hist. Illus. 1982, 17(1):30-35.

Rehbok, Philip F. The Philosophical Naturalists. Themes in Early Nineteenth Century British Biology. Publisher? 1983.

Reingold, Nathan.,ed. Science in America Since 1820.1976.

Riegert, Paul W. From Arsenic to DDT: A History of Entomology in Western Canada. University of Toronto Press, 1980.

Ross, W.G. "Franz Boas and the American Museum of Natural History." Etudes Inuit Studies. 1984, 8(1):145-64.

Rudwick, Martin J.S. The Meaning of Fossils: Episodes in the History of Palaeontology. London: Macdonald; New York: American Elsevier, 1972.

________. The Great Devonian Controversy: The Shaping of Scientific Knowledge Among Gentlemanly Specialists. Chicago: University of Chicago Press, 1985.

Stanley, George F.G., Ed. John Henry Lefroy. In Search of the Magnetic North. A Soldier-Surveyor's Letters from the North-West, 1843-1844. Toronto: The Macmillan Co. of Canada Ltd., 1955.

Stanton, William. The Leopard's Spots. Scientific Attitudes Towards Race in America, 1815-59.1960.

Stepan, Nancy. The Idea of Race in Science: Great Britain, 1800-1960. London: Macmillan, 1982.

Sterling, Keir B., Ed. Selected Works in Nineteenth Century North American Paleontology. New York: Arno, 1974.

________. Contributions to the History of American Natural History. New York: Arno, 1975.

Stewart, Susan. "Sir George Simpson: Collector." Beaver 1982, 313(1):4-9.

Stocking, George Jr., Ed. Observers Observed: Essays on Ethnographic Fieldwork. Vol.1, History of Anthropology. Madison, Wisconsin: The University of Wisconsin Press, 1983.

________., Ed. Objects and Others: Essays on Museums and Material Culture. Vol. 3, History of Anthropology. Madison, Wisconsin: University of Wisconsin Press, 1985.

________. Victorian Anthropology. New York: Free Press, 1987.

Thomas, Keith. Man and the Natural World. Changing Attitudes in England, 1500-1800. New York: Penguin Books, 1983.

Tory, H.M., Ed. A History of Science in Canada. Toronto: Ryerson Press, 1939.

Stresemann, Erwin. Ornithology. From Aristotle to the Present. With a Forward and Epilogue on American Ornithology by Ernst Mayr. Cambridge: Harvard University Press, 1975.

Trigger, Bruce. "Sir Daniel Wilson: Canada's First Anthropologist." Anthropologica 1966,7:3-37.

Turner, Frank M. Between Science and Religion: The Reaction to Scientific Naturalism in late Victorian England. New Haven, 1974.

Welker, Robert Henry. Birds and Men. New York, 1966.

Wheeler, Alwyne. (Ed.) Natural History in Early Nineteenth Century. London: Society for the History of Natural History, in press.

Warner, John Harley. "'Exploring the Inner Labyrinths of Creation': Popular Microscopy in Nineteenth Century America." Journal of the History of Medicine and Allied Sciences 1982, 37(1):7-33.

Wilson, David B. "Shaping Modern Perspectives: Science and Religion in the Age of Darwin." Pp.3-18 in Did the Devil Make Darwin Do It? D.B. Wilson ed., 1983.

Williams, L. Pearce. "Kant, Naturphilosophie and Scientific Method." Foundations of Scientific Method. Ronald N. Giere and Richard S. Westfall, eds. Bloomington: Indiana University Press, 1973, 3-22.

Williams, Raymond. "Ideas of Nature." Times Lit. Suppl. No.3588,(4 Dec.1970),1419-21.

Young, Robert M. Darwin's Metaphor, Nature's Place in Victorian Culture. Cambridge University Press, 1985.

________. "Malthus and the Evolutionists: the Common Context of Biological and Social Theory." Past and Present. No.43(1969),pp.109-45.

________. "Scholarship and the History of the Behavioural Sciences." History of Science. 5(1966),1-51.

Zeller, Suzanne. Inventing Canada. Early Victorian Science and the Idea of a Transcontinental Nation. Toronto: University of Toronto Press, 1987.

HISTORIOGRAPHY

Fisher, Robin. "Historical Writing on Native People in Canada." The History and Social Science Teacher. 1982,17(2):65-72.

Martin, Calvin. "The Metaphysics of Writing Indian-White History." Ethnohistory. 1979,26:153-60.

Mitchell, Marjorie, and Anna Franklin. "When You Don't Know the Language, Listen to the Silence: An Historical Overview of Native Women in B.C." in Not Just Pin Money. Barbara Latham, ed. Victoria, 1984.

Peterson, Jacqueline, and John Anfinson. "The Indian and the Fur Trade." Pp.223-58 in Scholars and the Indian Experience. W.G. Swagerty, ed. Bloomington: Indiana University Press, 1984.

Ray, Arthur J. "Fur Trade History as a Part of Native History." Pp.7-19 in One Century Later. I.A.L. Getty and D.B. Smith, eds. Vancouver: University of British Columbia Press, 1978.

________. "Reflections on Fur Trade Social History and Metis History in Canada." American Indian Culture and Research Journal. 1982,6(2):91-107.

Shortt, S.E.D. "Medical Professionalization: Pitfalls and Promise in the Historiography." HSTC Bulletin. 5:3 (Sept.1981)210-19.

Swagerty, William G., ed. Scholars and the Indian Experience. Bloomington: Indiana University Press, 1984.

Tanner, Adrian. "The End of Fur Trade History." Queen's Quarterly. 1983,90(1):176-91.

Trigger, Bruce G. "Ethnohistory: Problems and Prospects." Ethnohistory. 1982,29:1-19.

Vaughan, A.T. "From White Man to Red Skin: Changing Anglo-American Perceptions of the American Indian." American Historical Review. 1982,87:917-53.

Walker, James W. St. G. "The Indian in Canadian Historical Writing." Historical Papers Ottawa: Canadian Historical Association, 1971:21-51.

Young, Robert. "The Historiographic and Ideological Contexts of the Nineteenth Century Debate on Man's Place in Nature." Pp.344-438 in Changing Perspectives in the History of Science, Essays in Honour of Joseph Needham. Mikulas Teich and Robert Young, eds. London: Heinemann Educational Books, 1973.

THEORY AND METHODS

Anderson Robert S. "The Necessity of Field Methods in the Study of Scientific Research." In Science and Cultures. Pp.213-44. Edited by Everett Mendelsohn and Yehuda Elkana. Sociology of the Sciences, Yearbook 1981. Dordrecht, Holland; Boston; London: D. Reidel Pub. Co., 1981.

Barnes, Barry., Ed. Sociology of Science. Selected Readings. Harmondsworth: Penguin Books Ltd., 1972.

Bibby, Reginald W. "Searching for the Invisible Thread: Meaning Systems in Contemporary Canada." Journal for the Scientific Study of Religion. 1983,22(2):101-119.

Breton, Raymond. "The Production and Allocation of Symbolic Resources: An Analysis of the Linguistic and Ethnocultural Fields in Canada." Can. Review of Soc. and Anthro. 1984,21(2):123-44.

Brown, Theodore M. "Putting Paradigms into History." Marxist Perspectives. 1980,9:34-63.

Cohen, I. Bernard. Revolution in Science. Belknap Press of Harvard University Press, 1985.

Ben-David, J. <u>The Scientist's Role in Society</u>. Englewood Cliffs, N.J.: Prentice-Hall, 1971.

Freyd, Jennifer. "Shareability: The Social Psychology of Epistemology." <u>Cognitive Science</u>. 1983,7(3):191-210.

Fernandez, J., M. Singer, and M. Spiro. "On Symbols in Anthropology: Essays in Honour of Harry Hoijer." 1980. <u>Other Realities</u>. 1982,3:134.(?)

Geertz, Clifford. <u>The Interpretation of Cultures: Selected Essays</u>. New York: Basic Books, 1973.

________. <u>Local Knowledge: Further Essays in Interpretive Anthropology</u>. New York: Basic Books, 1983.

Gutting, Gary., Ed. <u>Paradigms and Revolutions</u>. <u>Applications and Appraisals of Thomas Kuhn's Philosophy of Science</u>. University of Notre Dame Press, 1980.

Hagstrom, Warren O. <u>The Scientific Community</u>. New York: Basic Books Inc., 1965.

Hesse, Mary. <u>Revolutions and Reconstructions in the Philosophy of Science</u>. Brighton: Harvester, 1980.

Jennings, Francis. "A Growing Partnership: Historians, Anthropologists and American Indian History." <u>Ethnohistory</u>. 1982,29(1):21-34.

Keller, Evelyn Fox. "Feminism and Science." <u>Signs</u>. <u>Jour</u>. <u>of Women in Culture and Society</u>. 1982,7(3):589-602.

Klemke, E.D., Robert Hollinger, and A. David Kline. <u>Introductory Readings In the Philosophy of Science</u>. New York: Prometheus Books, 1980.

Kokot, Waltraud, Hartmut Lang, and Eike Hinz. "Current Trends in Cognitive Anthropology." <u>Anthropos</u>. 1982,77(3/4):329-50.

Krohn, Roger G. "Scientific Ideology and Scientific Process: The Natural History of a Conceptual Shift." In <u>The Social Production of Scientific Knowledge</u>. Pp.69-99. Edited by Evertt Mendelsohn, Peter Weingart and Richard Whitley. Society of the Sciences Yearbook 1977. Dordrecht, Holland; Boston; London: D. Reidel Pub. Co., 1977.

Kuhn, Thomas. <u>The Structure of Scientific Revolutions</u>. Chicago, London: The University of Chicago Press, 2nd ed. 1970.

________. The Essential Tension: Selected Studies in Scientific Tradition and Change. Chicago, London: University of Chicago Press, 1977.

Lakatos, I. and A. Musgrave. Criticism and the Growth of Knowledge. Cambridge University Press, 1970.

Leatherdale, W.H. The Role of Analogy, Model and Metaphor in Science. New York: American Elsevier Pub. Co. Inc.,1974.

Linton, Ralph. The Study of Man. New York: D. Appleton-Cwentury, 1936.

Merton, Robert K. "Science, Technology, and Society in Seventeenth Century England." Osiris: Studies on the History and Philosophy of Sciences. Bruges, Belgium: St. Catherine's Press, 1938; with new Preface, New York: Howard Fertig, 1970.

________. Social Theory and Social Structure.[1949, 1957] New York: Free Press, 1968.

________. "The Sociology of Science. An Episodic Memoir." In The Sociology of Science in Europe. Pp.3-141. Edited by Robert Merton and Jerry Gaston. Carbondale and Edwardsville: Southern Illinois Press; London and Amstersdam: Feffer & Simons Ltd., 1977.

Munson, Ronald., ed. Man and Nature. Philosophical Issues in Biology. New York: Dell Pub. Co. Inc., 1971.

Nagel, Ernest. The Structure of Science. New York: Harcourt, Brace and World Inc., 1961.

Perovich, A.N. Jr. "Mysticism and the Philosophy of Science." Jour. of Religion. 1985,65(1):63-82.

Segall, Marshall H. "More than we need to know about Culture, But are Afraid not to ask." Jour. of Cross-Cultural Psychology. 1984,15(2):153-62.

Shweder, Richard and Robert LeVine. eds. Culture Theory: Essays on Mind Self and Emotion.1984.

Stewart, John A. "Achievement and Ascriptive Processes in the Recognition of Scientific Articles." Social Forces. 1983,62(1):166-89.

Taylor, James. The Scientific Community. Oxford University Press, 1973.

Thackray, A. "Natural Knowledge in Cultural Context." American Historical Review. 1974,74:672-709.

Trigger, B. "Ethnohistory: Problems and Prospects." Ethnohistory. 1982,29(1):1-19.

Williams, Raymond. Culture and Society, 1750-1850. Penguin Books, 1963.

________. "An Introduction to Reading in Culture and Society." in Fred Inglis, ed. Literature and Environment: Essays in Reading and Social Studies. London: Chatto and Windus, 1971.

________. Problems of Materialism and Culture. London, 1980.

Wolf, Eric. Europe and the People Without History. University of California Press, 1982.

Wolf, Eric. "Culture: Panacea or Problem?" American Antiquity. 1984,49(2):393-400.

Woolgar, S.W. "Writing on Intellectual History of Scientific Development: the Use of Discovery Accounts." Social Studies of Science. 1976,6:395-422.

Urry, James. "A History of Field Methods." In Ethnographic Research. A Guide to General Conduct. Pp.35-61. Edited by R.F. Ellen. Research Methods in Social Anthropology. Vol.1 New York: Academic Press, 1984.

Young, R.M. "Science as Culture." Quarto.1979,2:7-8.

________. "Science is a Labour Process." Science for People.1979,43-44:31-7.

TECHNICAL LITERATURE

Checklist of North American Birds. Prepared by a Committee of the American Ornithologist's Union. Fifth Ed., Baltimore: The Lord Baltimore Press Inc., 1957.

Ellen, R.F., Ed. Ethnographic Research. A Guide to General Conduct. Research Methods in Social Anthropology. Vol.1 New York: Academic Press, 1984.

Heppell, David. "The evolution of the Code of Zoological Nomenclature," in History in the Service of Systematics. Papers from the Conference to celebrate the Centenary of the British Museum (Natural History) 13-16 April, 1981. Edited by Alwyne Wheeler and James H. Price. London: Society for the Bibliography of Natural History, 1981.

Honigmann, John. _The Development of Anthropological Ideas_. The Dorsey Series in Anthropology. Homewood, Illinois; Arundel, Sussex and Georgetown, Ontario: The Dorsey Press, 1976.

International Code of Zoological Nomenclature. Third Ed., adopted by the XX General Assembly of the International Union of Biological Sciences. London, 1985.

Pelto, Pertti. _Anthropological Research. The Structure of Inquiry_. New York; Evanston; London: Harper & Row Pubs., 1970.

Peterson, R.T. _A Field Guide to Western Birds_. Second Ed. Boston: Houghton Mifflin Co., 1961.

Pettingill, Jr. Olin Sewall. _Ornithology in Laboratory and Field. Fifth Ed. Academic Press, 1985_.

Van Tyne, Josselyn and Andrew J. Berger. _Fundamentals of Ornithology. New York: Dover Pubs. Inc., 1958_.